Woodland Caribou Provincial Park

Background Information

Ontario
Ministry of Natural Resources

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Minister

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Deputy Minister

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Vince Crichton

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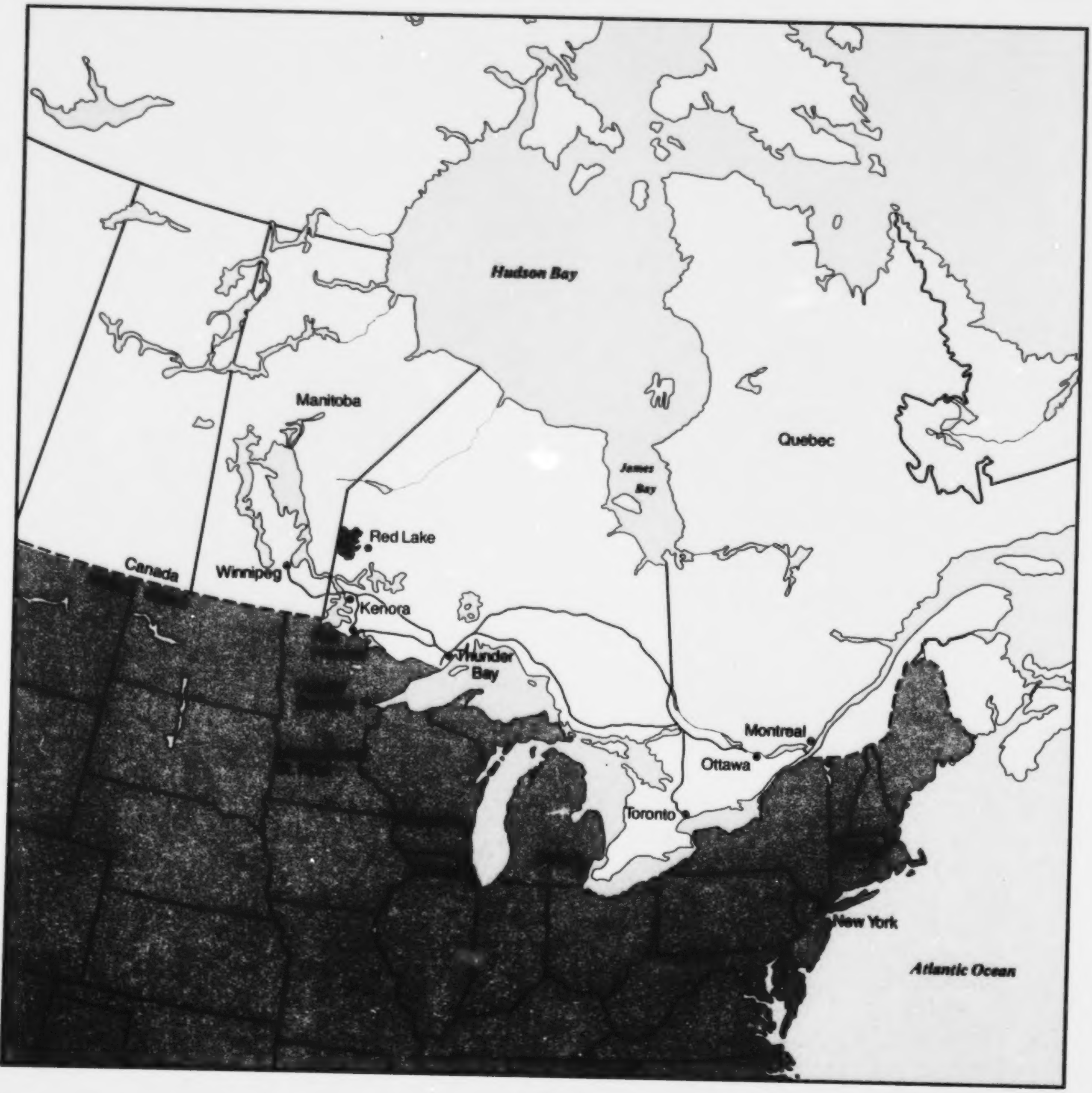
Figure 1

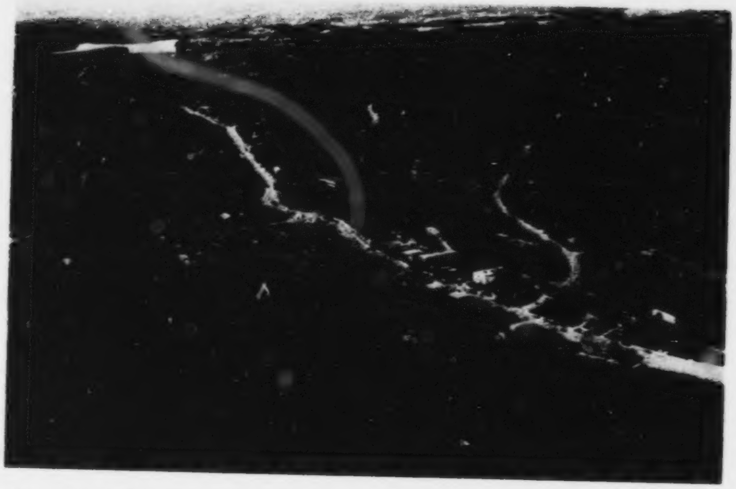
Location

Woodland Caribou Park is situated within a two days drive of some 25 million people.

■ Woodland Caribou Provincial Park


Hudson Bay
Manitoba
Quebec
James Bay
Red Lake
Canada
Winnipeg
Kenora
Thunder Bay
Montreal
Ottawa
Toronto
New York
Atlantic Ocean
0
300
600 km
North

Introduction



"Town of Red Lake"

Woodland Caribou Provincial Park is located in Northwestern Ontario between Red Lake and the Manitoba border (Fig. 1). At 450,000 hectares (1.2 million acres) it is the fifth largest provincial park in Ontario. It extends approximately 100 kilometres (62 miles) from north to south and 65 kilometres (40 miles) from east to west. This area represents a vast unspoiled wilderness, yet it is within easy access of Northwestern Ontario, Manitoba and the midwestern United States.

It has long been recognized that this core area to the west of Red Lake exhibits characteristics which are unique to Ontario. As a result, Woodland Caribou Park and its resources have been under study since shortly after the second world war. Since that period the boundaries have changed numerous times and the area has been afforded different degrees of protection. At one point in time the area was being considered by Parks Canada for inclusion in the National Parks System. Over the past 35 years the area has been referred to as the Caribou Game Preserve (1948), Irregular Lake Park Reserve (1967), Woodland Caribou Park Reserve (1972), Atikaki study area (1974), and finally Woodland Caribou Provincial Park (1983).

In June of 1983, following years of study and public consultation, the Minister of Natural Resources tabled a series of land use guidelines for the province. Included in these were 6 Wilderness Parks, 35 Natural Environment Parks, 25 Waterway Parks, 74 Nature Reserves, 12 Recreation and 3 Historical Parks. Woodland Caribou is one of the new Wilderness Parks and was so designated as Ontario Regulation 343/83 made under The Provincial Parks Act on June 7, 1983.

The Ontario Provincial Park Policy defines Wilderness Parks as "substantial areas where the forces of nature are permitted to function freely and where visitors travel by non-mechanized means and experience expansive solitude, challenge and personal integration with nature". The policy also describes a protection, recreation, heritage appreciation and tourism objective for the provincial parks system. Wilderness Parks contribute primarily to the protection, recreation and heritage appreciation objectives.

In the Backgrounder to the Land Use Guidelines, released in June of 1983, a number of decisions were outlined regarding permitted uses within the newly created parks. For Woodland Caribou Park these permitted uses included hunting, trapping, mineral exploration, tourism, wild rice harvesting and commercial fishing. In addition, a commitment was made by the Minister to explore ways of increasing tourism benefits associated with the Park. The location, nature and extent of these and other park uses will be determined as part of the Management Plan. The Park Management Plan will provide the Ministry and the public with a definition of the role and significance of Woodland Caribou Park within the Provincial Park system. It will identify zoning within the park and provide a statement of park policy which will direct the protection, use, development and management of the park's resources.

This Background Information Document represents a summary of resource information which has been collected for the park area over the years. The information contained herein is largely a result of a comprehensive field inventory program which was conducted throughout the winter and summer of 1985 and can be viewed as a snapshot in time of the park and its resources.

Additional information is available in a series of technical reports which include the results of investigations which were either too detailed or technical to be reported on fully in this Background Information Document.

This document will serve as a background for the evaluation of Issues and Options and will form part of the Preliminary and Final Management Plans for Woodland Caribou Provincial Park.

Regional Context

"Woodland Caribou Park has some of the best canoeing and fishing in Ontario"

"Pictographs along the Bloodvein River are of international significance"

Resource Characteristics

Woodland Caribou Park is an outstanding example of the Canadian Shield, representing a typically glaciated landscape, characterized by elongated lake systems, sudden changes in elevation, erratic drainage patterns, thin soils and massive bedrock outcrops. Located in the Arctic Watershed, the park's two principal river systems, the Bloodvein in the north and the Gammon in the south, flow westerly into Lake Winnipeg and eventually into Hudson Bay. The vegetation is generally representative of the Southern Boreal Forest Region, however the hot, dry climate, thin soils and the proximity to the prairies, combine to produce a unique western influence in the flora of the area. The park is located in one of the highest forest fire occurrence areas in Ontario and represents a dynamic ecology which can change dramatically in a very short period of time. In combination, these factors create a mosaic of diverse habitats which support a wide variety of wildlife species including beaver, otter, marten, fisher, great blue heron, osprey and bald eagle. There are black bear and moose as well as one of Ontario's largest surviving herds of woodland caribou south of the Hudson Bay Lowlands.

In addition to the two major river systems there are hundreds of kilometers of high quality canoe routes. The beautifully rugged terrain produces a pattern of small bedrock lakes linked by a series of short steep drops containing numerous rapids and falls. There are archaeological sites and pictographs scattered along prehistoric trading routes. One such site, located on the Bloodvein River, contains a large pictograph which is considered to be of international significance.

The park contains some of the highest quality recreational fisheries in Ontario. Walleye, northern pike and lake trout are the most sought after species and this fishery serves to sustain a tourism industry which contributes significantly to the economy of the region.

In total, Woodland Caribou Park represents an intact and unique wilderness landscape of Ontario which will be shown to contribute significantly to the Provincial Parks System.

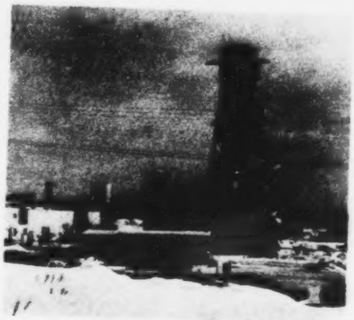
Population Centres

Woodland Caribou Park is located within a two days drive of some 25 million people (Table 1). Toronto is included for comparative purposes and is not considered to be a significant market for Northwestern Ontario at the present time.

"Woodland Caribou Park contains a typically glaciated landscape characterized by thin soils and massive bedrock outcrops"

Table 1. Distances to Major Population Centres

	straight line distance (km)	road distance (km)	driving time (hrs)
Winnipeg	210	480	6
Thunder Bay	500	575	7
Minneapolis	700	785	10
Des Moines	1046	1215	15
Milwaukee	1020	1212	15
Chicago	1140	1310	16
Toronto	1415	1975	24



"The Red Lake Belt is one of the richest gold producing areas in North America"

The bordering communities of Red Lake, Ear Falls and Kenora have a relatively stable population of approximately 25,000 people and as such represent a small percentage of the overall market. Potential park visitors are likely to originate from major Ontario, Manitoba, and midwestern United States markets (Table 2).

Table 2. Population of Major Markets for Woodland Caribou Provincial Park

	Population
Northwestern Ontario (Thunder Bay & West)	200,000
Manitoba	1,026,000
Minnesota	4,076,000
Wisconsin	4,706,000
Illinois	11,427,000
Iowa	2,914,000
Indiana	5,490,000

Surrounding Land Use

The predominant economic activities surrounding Woodland Caribou Park are logging and mining. Other uses include trapping, commercial tourism and crownland recreation largely associated with fishing and hunting.

Mining

The Red Lake area is one of the richest gold producing areas in North America and has been extensively explored and developed since the 1920's. All totalled some 12 mines have come into production over the past 70 years, most of them within the townships of Red Lake and Golden (formerly Improvement District of Balmertown). At the present time there are two actively producing gold mines and mining continues to be the major economic activity in the Red Lake area. A large open pit iron ore mine, located between Red Lake and Ear Falls, has recently announced its closure following some 18 years of production. This cycle of mine openings and closures has become the norm in most mining communities throughout the north.

Other significant staking and exploration activity has occurred in the Bee Lake greenstone belt on the park's southern boundary between Eagle Lake and the Manitoba border, and in the Sydney Lake and Longlegged Lake areas off the southeastern corner of the park. No significant mineral occurrences have been discovered within the park's boundaries as evidenced by the limited staking activity that has occurred over time. The last active mining claims within the park were off the west end of Red Lake on Douglas Lake (Mulcahy Township) in 1981.

Logging

Logging and forest management are the most visible surrounding land use and in many ways have the greatest potential impact on Woodland Caribou Park. Logging and road construction are not permitted uses within the boundaries of the park, however, roads associated with logging outside of the park can have a significant impact on access opportunities and travel patterns of surrounding recreational users.

The park is bounded on the east and south sides by the Boise Cascade timber licence for the Pakwash forest, and the Red Lake and Minaki Crown Management Units. Forest management activities are governed by forest management plans for each of these units. These plans detail allowable harvest levels, harvesting areas, road locations and forest regeneration activities. Examination of these plans indicates an increase in forest management activity as evidenced by the expanding road networks.

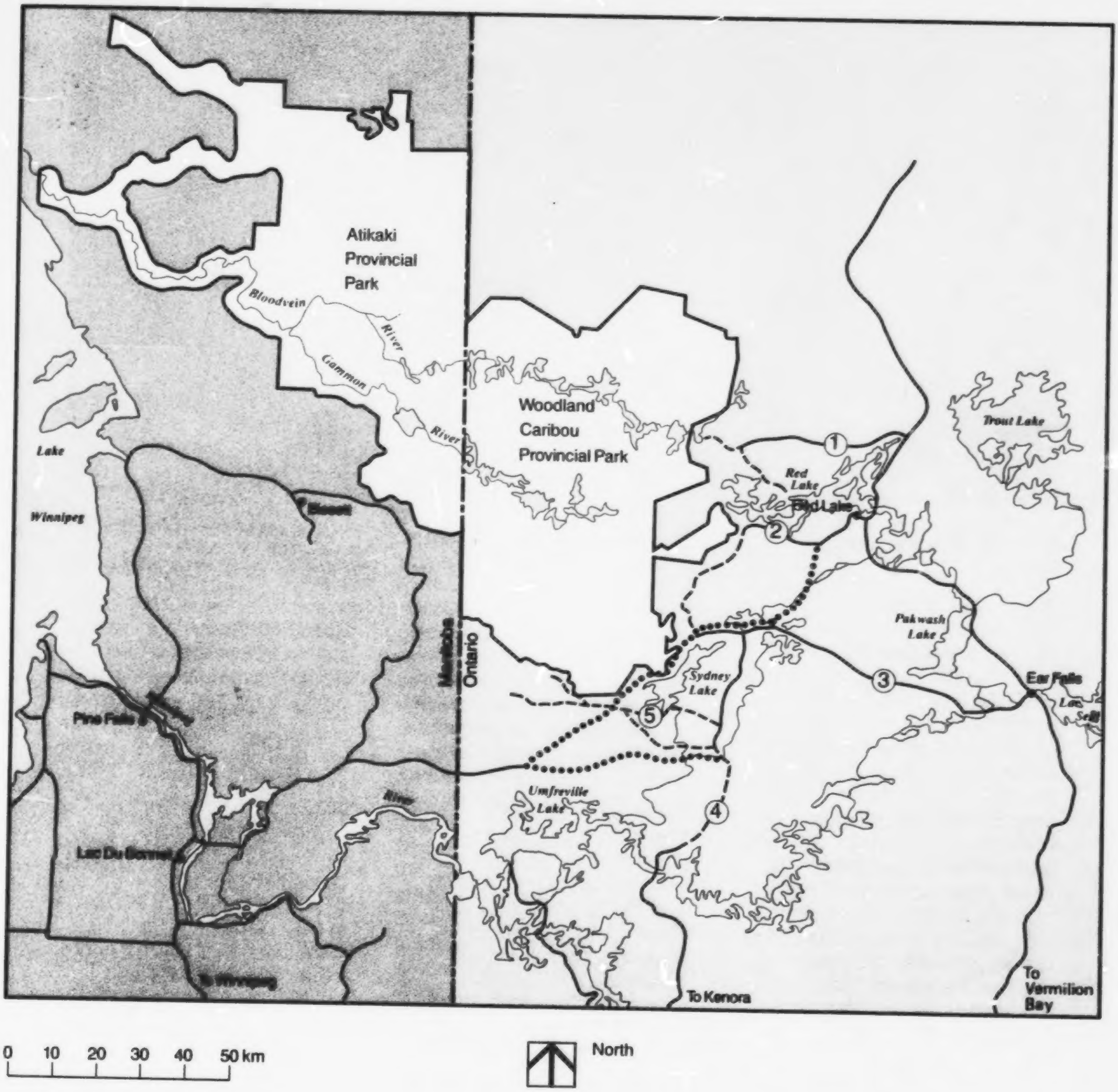
Figure 2

Regional Context

Together, Woodland Caribou and Atikaki Provincial Parks represent over two million acres of outstanding wilderness.

① Pine Ridge road
② Suffel Lake road
③ Long-Legged Lake road
④ English River road
⑤ North Minaki Crown road

─ Existing roads
--- Proposed roads
•••• Alternate routes from Manitoba



Atikaki
Provincial
Park
Bloodvein
River
Gammon
River
Woodland
Caribou
Provincial Park
Lake
Winnipeg
Bissett
Pine Falls
Winnipeg
Lac Du Bonnet
River
To Winnipeg
Manitoba
Ontario
Trout Lake
Red
Lake
Red Lake
Pakwash
Lake
Sydney
Lake
Umfreville
Lake
Ear Falls
Lac
Seul
To Kenora
To
Vermilion
Bay
1
2
3
4
5
0
10
20
30
40
50 km
North

Access/Transportation Routes

Woodland Caribou Park is accessible primarily by aircraft at the present time. As a result of surrounding timber harvesting activities there are a number of major forest access roads under construction, or being planned, which may have an impact on the park (Fig. 2). These roads are described as *potential* access points along the eastern and southern boundaries. The decision to provide road access to any or all of these locations will be made in recognition of all factors including carrying capacity, dispersal, impact on other resource values and public opinion.

1. **Pine Ridge Road** This road, to be completed by 1987, is located on the Red Lake Crown Management Unit and will terminate within three km of Peisk Lake at the headwaters of the Bloodvein River. This road may provide an opportunity for access to the northern portion of the park.
2. **Suffel Lake Road Extension** The Suffel Lake road is planned to extend south and west of Red Lake to join up with the Longlegged Lake Road (3). The Suffel Lake Road extension will run adjacent to the Douglas, Onnie and Telescope Lake areas at the eastern end of the Gammon River.
3. **Longlegged Lake Road** This road extends west from Ear Falls and is the major access road for the Boise Cascade Pakwash Forest. This road will extend to the north where it will join with the Suffel Lake Road in order for logging contractors to access the Red Lake work force.

"Roads associated with surrounding logging activity will provide opportunities for planned access to the park"

4. **South Pakwash (English River) Road** This road is currently under construction and will provide the major access to the southern portion of the Pakwash Forest. Crossing the English River at Separation Narrows, it will provide a significant reduction in haul distance to the Boise Cascade paper mill in Kenora. When completed it could provide an alternate access opportunity to the southeastern corner of the park in the Sydney Lake area.

5. **North Minaki Crown Unit Road** This road is currently being planned to access the area south of Sydney and Eagle Lakes. Although the route location is not confirmed it may provide an opportunity to access the park's south sector. This road will be required for the 1991–96 operating period and planning for this road will include full public consultation.
6. **Alternate Route from Manitoba** Studies are underway on the feasibility of an alternate route from the Red Lake area to Manitoba. This road proposal is in the preliminary planning stage and if constructed could provide access to the southeastern portion of the park near Sydney Lake. This road would represent a major public sector project, having significant economic and regional development implications.

Manitoba

Woodland Caribou Park shares 70 km of its western boundary with the Province of Manitoba. Historically, Manitoba based development and access has influenced the use of Ontario's resources in this border area. Tourist camps have been developed on boundary waters and numerous Indian Bands based in Manitoba have been recognized as having traditional hunting and trapping rights in Ontario. More recently the Manitoba government has taken a major step in the development of its provincial parks system with the announcement of a large wilderness park between Woodland Caribou Park and Lake Winnipeg. Over the years the Ontario and Manitoba governments have worked co-operatively in the joint management of these border areas.

Development

Manitoba has developed six commercial outpost camps and two private hunt and fish camps with direct access to Woodland Caribou Park. Seven of these eight facilities are located in the vicinity of the Gammon River on Obukowin, Craven and Carroll Lakes and on the Gammon River itself. The remaining outpost camp is located one km west of the border on the Bloodvein River at Artery Lake (Fig. 3). The majority of fishing activity associated with these camps occurs within Ontario.

Access

At the present time the Manitoba provincial highway system extends east to within 12 km of the border at Wallace Lake, which is substantially developed with cottages and a provincial campground, and to within six km of the border at Beresford Lake at the southwest corner of Woodland Caribou Park. Land access into Ontario from these points is confined to canoe traffic via the Wanipigow River to the Haggart River system, and to Carroll Lake via Obukowin Lake. These routes out of Wallace Lake are considered to be fairly difficult with numerous long and sparsely travelled portages. Access can also be gained to Woodland Caribou Park via the Wanipigow and Broadleaf Rivers to Aikens Lake and up the Gammon River to Carroll Lake. There is potential for increased access to the southwestern corner of Woodland Caribou Park as a result of developments associated with the new Manitoba park.

Atikaki Provincial Park

The Manitoba Government has recently established a large wilderness park which extends from the Ontario border west to Lake Winnipeg in the Bloodvein—Pidgeon River area (Fig. 2). Known as Atikaki (Saulteaux—Ojibwa for "country of the caribou") this area borders on Woodland Caribou Park and represents Manitoba's first wilderness park.

Atikaki Provincial Park represents a transition zone between the Canadian Shield and the Prairies and contains some of the finest whitewater canoeing opportunities in Eastern Canada. Together, Woodland Caribou and Atikaki Provincial Parks represent over 850,000 hectares (two million acres) of outstanding wilderness. The Manitoba and Ontario governments will continue to work closely to share ideas on the management of this large wilderness area.

Development and Land Tenure

The existing development within Woodland Caribou Park can be divided into four categories as follows:

Commercial Tourist Establishments
Cottages and Private Resorts
Resource Harvesting Developments
Boat Caches

For the purposes of this section, *commercial tourist establishment* is as defined in the Tourism Act and includes any premises operated to provide sleeping accommodation for the travelling public but does not include camps operated by charitable corporations, summer camps, or clubs owned by its members and operated without profit or gain. *Cottages and private resorts* includes all remote cottages, private hunt and fish camps and camps owned by corporations or corporate heads for use by their staff, clients and guests. *Resource harvesting developments* includes primarily trap cabins while *boat caches* includes all private resident, commercial, and resource harvester boats. It is important to note that there exists a wide range of capital value, quality of accommodation and use associated with developments within each of these categories.

Commercial Tourist Establishments

Lodges

There are two main base lodges located within Woodland Caribou Park (Fig. 3). The largest of these, Sabourin Lake Lodge, is located just off the Bloodvein River in the north end of the park. Sabourin Lodge has been in existence since 1958 and is a full service American Plan fly-in lodge employing up to 36 persons on a seasonal basis. The facility consists of a large main lodge with accommodation and dining facilities and 4 log guest cabins. Total guest capacity is 48 persons and there are a number of auxiliary buildings on the property. In addition to fishing the western portion of the Bloodvein River from Larus to Artery Lakes, Sabourin Lodge offers fly-in day trips to several lakes surrounding the lodge.

"Sabourin Lake Lodge. The Tourist industry contributes significantly to the regional economy."

The other main base lodge is Viking Island located on Douglas Lake off the west end of Red Lake. Viking Island was built in 1948 by Red Lake pioneers Arthur and Florence Carlson, and was one of the first tourist camps in the Red Lake area. This family business, in its second generation, offers American Plan vacations and employs up to seven persons on a seasonal basis. Guest capacity is 24 and fishing activity is distributed over several lakes surrounding Douglas. Because of the sensitive nature of these lake trout waters, great care is taken by the current owners to limit the number of guests. Consequently, Viking Island is closed for a good portion of July and August each season.

Both Sabourin Lodge and Viking Island are situated on patented (private) properties.

Outpost Camps

There are 15 commercial outpost camps located within the park. All but four of these camps are located along the Bloodvein and Gammon River systems and most are of frame construction. Bed capacities range from four to fourteen and visitation at the individual camps varies from virtually none to over 200 guests per year. This variability is related to the fish species available, fishing success, quality of accommodation and marketing effectiveness of individual operators. These housekeeping operations seldom provide guides or cooks and packages range from 2–7 days depending on the operator. Prices are variable and are tied largely to air travel costs and length of stay. The majority of visitation is related to fishing, while hunting packages, offered by only a few operators, are seen as more of a post season bonus.

"Outpost camp on Optic Lake"

Tenure for all outpost camps is by annual Land Use Permit and all are registered to licenced Ontario tourist operators.

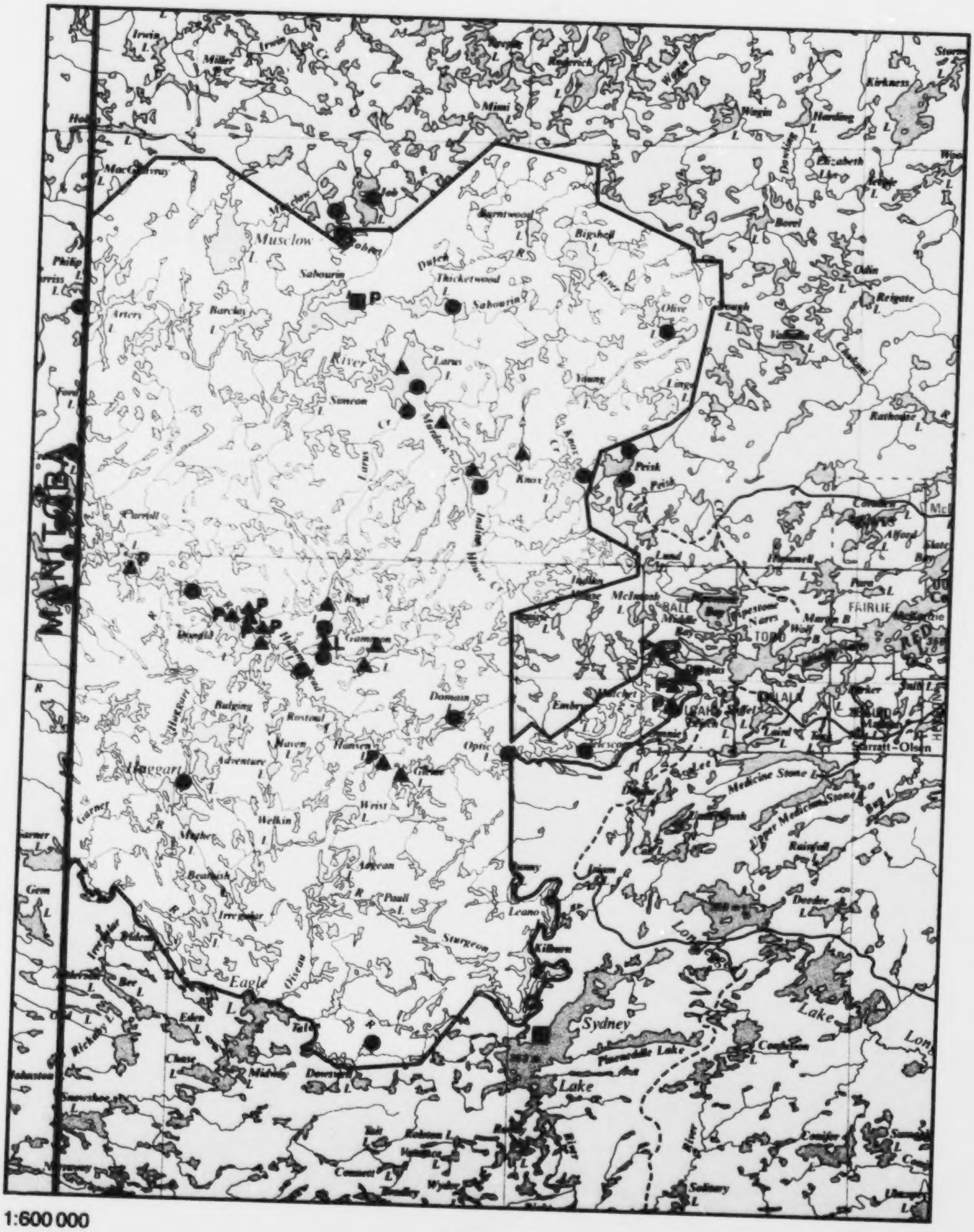
Cottages and Private Resorts

There are 22 cottages and private resorts located within Woodland Caribou Park (Fig. 3). Eighteen of these developments are located along the Gammon River system from Douglas Lake in the east to Carroll Lake in the west. The remaining 4

Existing Development and Land Tenure

Existing development consists of two main base lodges. 15 outpost camps and 22 cottages and private resorts.

■ Commercial lodge
● Outpost camp
▲ Cottage and private resort
P Patented land
L Crown lease


MANITOBA
Irwin L.
Miller
Roderick
Mimi
Wagin
Harding L.
Kirkness
Elizabeth Lk.
MacGillivray L.
Job
Musclow
Sabourin
Barntwood
Bigshell
Dutch
Thicketwood
Sabourin
Olive
Philip
Arters
Barclay
River
Larus L.
Simcoe L.
Young
Linge
Maddock
Knox
Peisk
Peisk
Indian House Cr.
Carroll
Rugel
Gammon
Dewald
Bulgeing
Rostoul
Domain
Haven
Hansen
Optic
Haggart
Adventure
Welkin
Wrist
Garnet
Mather
Beatnish
Argean
Paull L.
Irregular
Sturgeon
Eagle
Oiseau
Kilburn
Eden L.
Chase
Midway
Dowswell
Sydney
Lake
Pinenddle Lake
Medicine Stone L.
Upper Medicine Stone L.
Rainfall
Deedee
Long
Lake
BALL
Middle Bay
Pipestone Narrs
TODD
FAIRLIE
RED
McIntosh
Embry
Snowshoe
Johnston
Richards
Gem
Coniferous
Salinary
Connell
Scarratt-Olsen

1:600 000

0 10 20 km

North

"Wamserville on Donald Lake. There are 22 cottages and private resorts within the park."

cottages are located on Murdock and Larus Lakes midway along the Bloodvein River in the north part of the Park. As in the outpost camp sector these private developments exhibit a wide range of use, from private cottages, used by immediate family members and friends for 1 to 2 weeks per year, to the larger private resorts and clubs used by corporate staff, clients and guests throughout the entire season. Some of these large private resorts have an annual visitation of over 100 guests, representing several hundred user days per year. The three largest private developments within the park include Carroll Lake Fishing & Hunting Ltd., Wamserville on Donald Lake, and Gammon Lake Lodge Ltd.

The cottages and private resorts within the park originated through a variety of methods including private land purchases in the 50's and early 60's, and crown land cottage dispositions in the 60's and early 70's. Two of the crown land cottages have permit restrictions which allow for the construction of tent frames only. There is one 5 lot private cottage subdivision located on Hansen Lake midway along the Gammon River.

Of the 22 private developments within the park 20 are registered to non-residents of Canada and 13 are located on private land (Table 3).

Table 3. Land Tenure of 22 Private Developments within Woodland Caribou Provincial Park.

Location	# of Private Developments	Tenure
Douglas	2	Patented
Hatchet	1	
Hansen	4	
Donald	4	
Carroll	1	
Larus	1	
Glen	1	Land Use Permit
Gammon	2	
Royd	1	
Donald	1	
Murdock	3	
Gammon	1	Crown Lease (expires 1993)
TOTAL	22	

"Boat caches account for a majority of fishing activity on some lakes"

Resource Harvesting Developments

This category includes primarily the 21 trap cabins which are distributed uniformly throughout the park (Fig. 14). These cabins are limited to 400 square feet in size and there are 1–3 cabins per trapline. These sites often include a storage shed to house snowmachines, gas, traps and other trapping equipment. The number of cabins is restricted to the minimum number required to harvest an entire trapline and is dependent on trapline size and ease of travel. Normally there is one main trap cabin per line with additional cabins being small overnight shelters.

In addition to the trapper cabins there are a few shelters and storage sheds associated with some of the wild rice licences throughout the park. These shelters are used to house rice harvesting equipment and supplies and occasionally serve as overnight accommodation during the short harvesting season in August.

Boat Caches

Current regulations require that all boats cached on crown land be registered under a boat cache decal program. In 1985, there were 170 registered boat caches within Woodland Caribou Park (Fig. 4). These boats were divided into three categories as follows:

Commercial Operators	126
Resource harvesters (trappers, rice harvesters, etc.)	31
Private residents	13
TOTAL	170

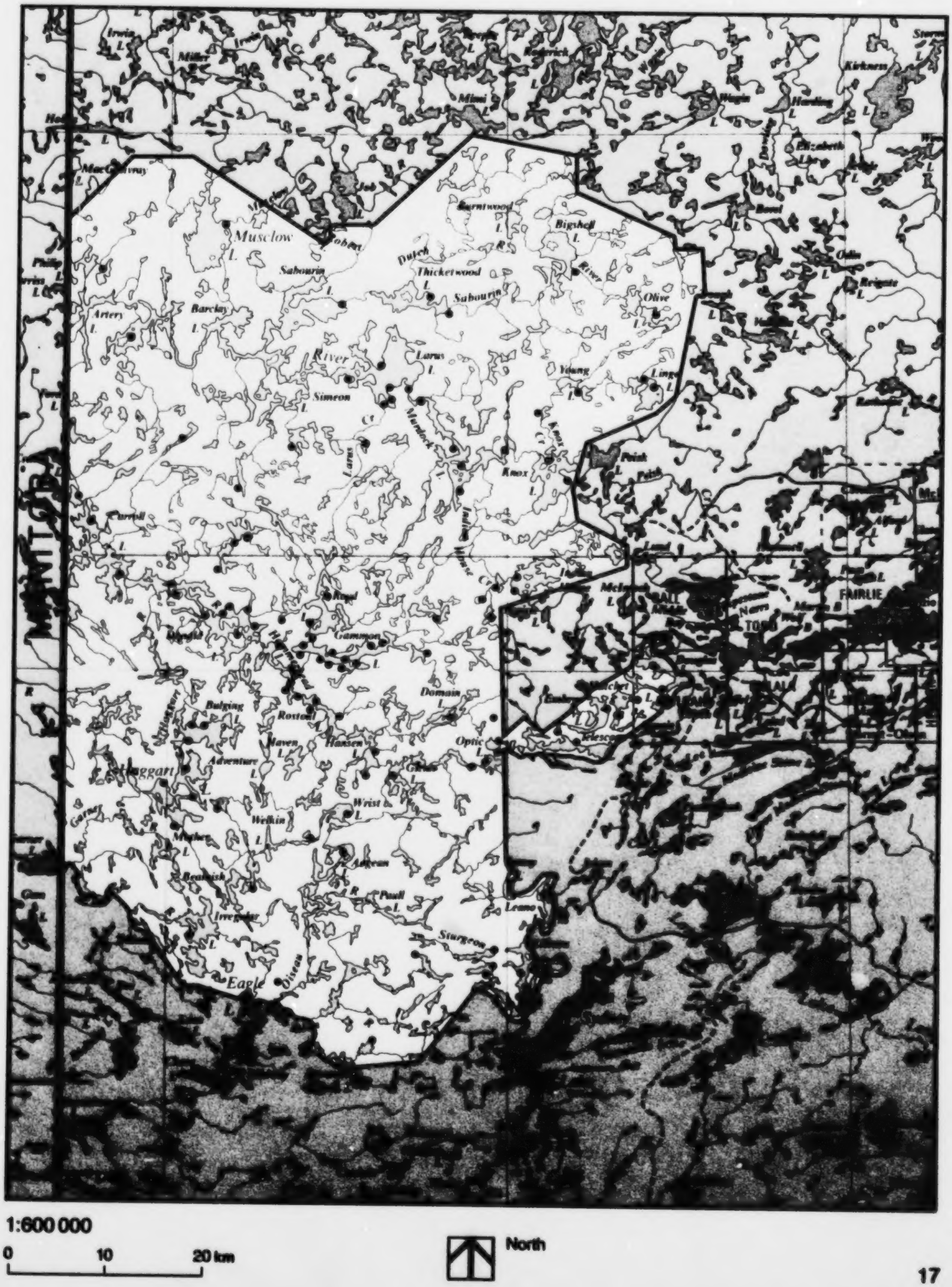
The use associated with these boats is extremely variable and difficult to quantify. The highest use is associated with the 46 boats registered to commercial air carriers. Many of these boats are used consistently for short camping or day trips and this results in high fishing pressure as limits are often taken by anglers on a daily basis. These types of fisheries are highly mobile and often compete for fisheries which are utilized by other boat cache or tourist operators. An example of this situation occurs on Kilburn Lake where 16 boat caches are registered to seven different commercial interests. These boats are in addition to boats which utilize the lake via water access from elsewhere on the system. This competitive situation creates an atmosphere which can often lead to overexploitation of resources in certain lakes.

Figure 4

Boat Caches

Many of the 170 boat caches are used for short camping and day trips, resulting in high fishing pressure on some lakes.

⊡ Registered boat cache locations


Musclow L.
Sabourin
Thicketwood
Sabourin
Dutch
Barclay L.
Artery L.
River
Simeon L.
Larus L.
Bigshell L.
Olive
Young L.
Knox L.
Carroll L.
Gammon
Rostoul
Domain L.
Bulging
Haven L.
Hansen L.
Optic
Adventure
Taggart
Welkin
Wrist L.
Aegean
Paull L.
Irregular
Eagle L.
Sturgeon
Leano
MANITOBA
FAIRLIE
1:600 000
0
10
20 km
North

Natural, Cultural and Recreational Resources

Climate

Woodland Caribou Park, situated within the English River climatic region, has a continental climate characterized by hot, dry summers and cold, clear winters.

The climate of the small English River region is unique to Ontario in that it is controlled by 3 major continental air masses: the very cold arctic air mass situated over the ice cap regions; the cold polar air mass located over the territories; and the dry prairie air mass that originates to the south-west from the foothills of the Rockies. These air masses, and the close proximity to Manitoba, produce a climate closer to that of the prairies as opposed to the cooler and wetter character of the boreal forest.

Winter

Winters in Red Lake are generally cold and clear with an average mean daily temperature in January of -20.4 degrees celsius (Table 4). Average annual snowfall of 184 cm compacts into a mean ground snow depth of 44 cm. The dominant wind directions during the winter months are from the northwest, west and southwest.

Summer

During the summer months, Hudson Bay's influence on Ontario's weather pattern causes NW–SE trending temperature isotherms, while the close proximity of the dry prairie air mass and the Great Lakes produces a significant increase in the mean annual precipitation from west to east (Fig. 5). This prairie influence creates an average July daily temperature for the park of 18.4 degrees C, which is 2.2 degrees C warmer than Quetico Provincial Park and Gravenhurst.

Table 4
Climate of Woodland Caribou Provincial Park

	Mean Daily Temperature (C)			Mean Precipitation		Direction of Winds (% of Time)								
	Max.	Min.	Avg.	Snowfall (cm.)	Rainfall (mm.)	N	NE	E	SE	S	SW	W	NW	CALM
Jan.	–15	–25.8	–20.4	33.3	Trace	8	7	6	10	9	16	21	22	2
Feb.	–10.35	–23.05	–16.7	27.9	2.0	8	7	6	10	9	16	21	22	2
Mar.	–2.2	–15.6	–8.9	20.6	1.5	12	13	11	13	9	12	10	16	2
Apr.	7.1	–4.7	1.2	18.8	23.1	12	13	11	13	9	12	10	16	2
May	14.5	2.3	8.4	5.8	45.5	12	13	11	13	9	12	10	16	2
June	20.6	8.8	14.7	0.8	76.7	9	12	8	12	10	16	14	19	1
July	24.15	12.65	18.4	0	89.9	9	12	8	12	10	16	14	19	1
Aug.	22.5	11.7	17.1	0	77.5	9	12	8	12	10	16	14	19	1
Sept.	15.9	6.1	11.0	0.8	69.3	8	9	7	12	10	17	15	22	0
Oct.	8.85	0.75	4.8	7.6	33.3	8	9	7	12	10	17	15	22	0
Nov.	–3.05	–9.35	–6.2	31.8	10.4	8	9	7	12	10	17	15	22	0
Dec.	–11.05	–19.75	–15.4	36.3	0.8	8	7	6	10	9	16	21	22	2
YEAR	6.05	–4.65	.7	183.7	430.0									

The park's average annual precipitation is the second lowest in Ontario at 60.9 cm, compared to Quetico and Toronto which have 69 and 86 cm respectively. Two-thirds of this precipitation (36 cm) falls from May to September.

Winds are generally from the northwest, southwest and west, however, during the spring and early summer, there is an increase in easterly winds (Table 4).

The implications of this small inclusion of continental prairie air mass into the northern Ontario boreal forest are numerous. The correlation between the climatic and forest regions identify this area as a transitional zone between the Great Lakes-St. Lawrence and Boreal forests, producing a high and interesting floral diversity. The unique climatic conditions have also produced a significant prairie vegetation influence. The hot dry prairie air mass and the predominance of bedrock, combine to produce the fire prone jack pine forests, as well as the associated woodland caribou habitat. The warm dry climate also enhances the comfort and inherent desirability of recreation in the park.

"Sunset on Donald Lake"

Figure 5

Climate : Temperature and Precipitation

Woodland Caribou Park is influenced by a prairie air mass, producing one of the hottest and driest climates in Ontario.

July mean daily temperature

Mean annual total precipitation

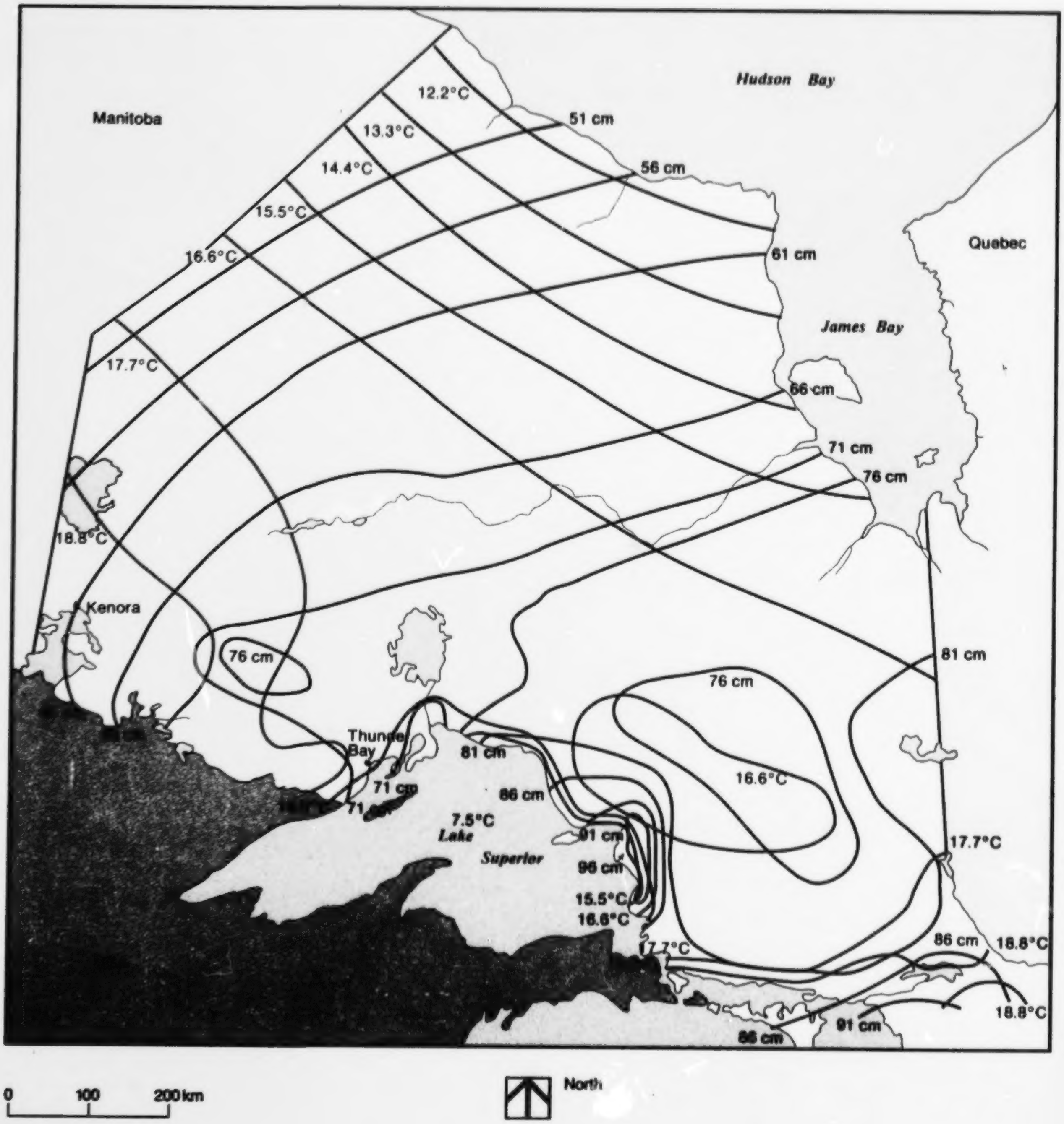

Hudson Bay
Manitoba
12.2°C
51 cm
13.3°C
14.4°C
56 cm
15.5°C
16.6°C
61 cm
Quebec
James Bay
17.7°C
66 cm
71 cm
76 cm
18.8°C
Kenora
76 cm
81 cm
76 cm
Thunder Bay
81 cm
71 cm
16.6°C
86 cm
71 cm
7.5°C
Lake Superior
91 cm
96 cm
15.5°C
16.6°C
17.7°C
17.7°C
86 cm
18.8°C
18.8°C
91 cm
86 cm
0
100
200 km
North

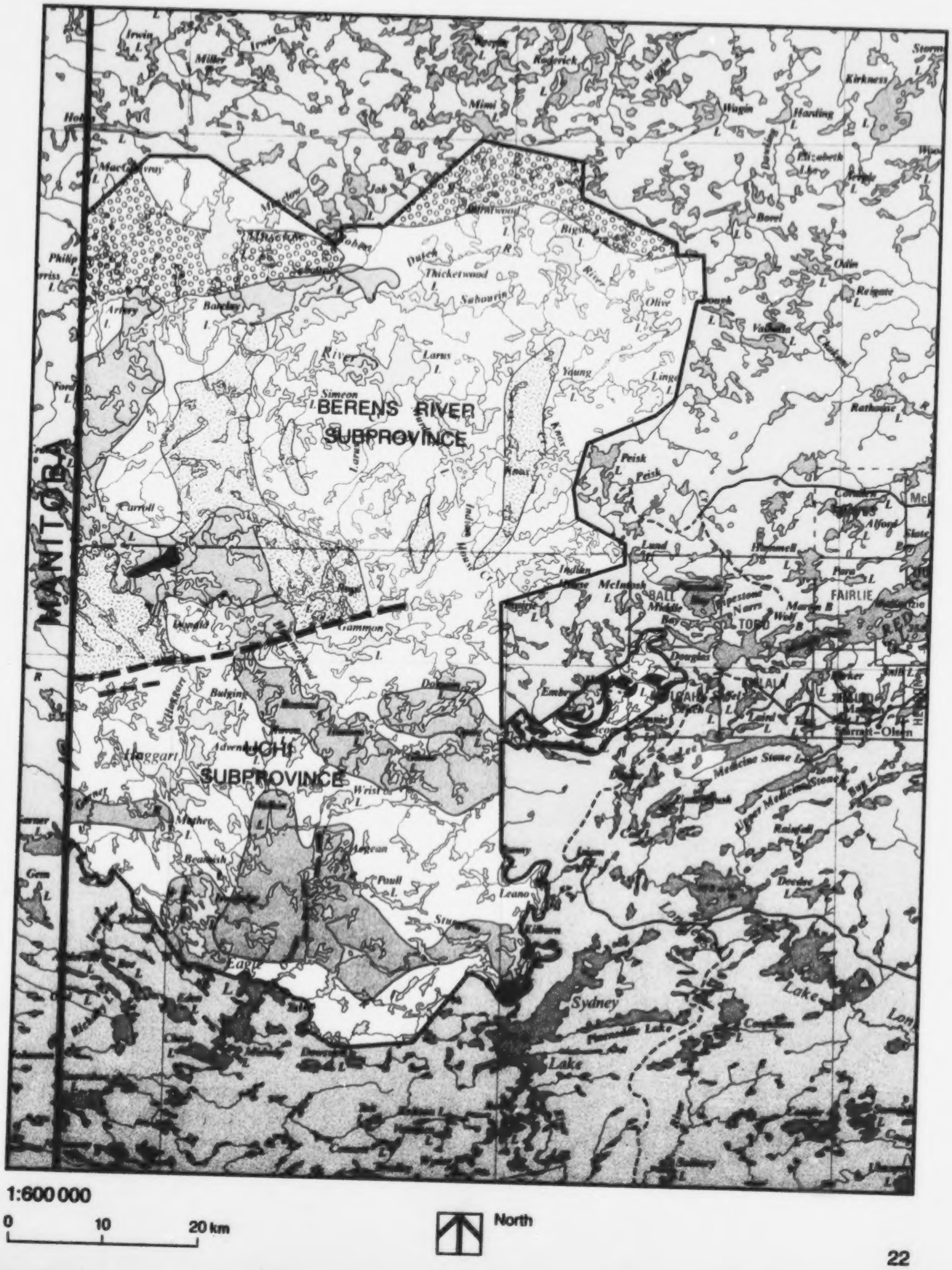
Figure 6

Bedrock Geology

The Wanipigow-Wallace Lakes fault separates the older Uchi subprovince in the south from the younger Berens River subprovince in the north.

Early Precambrian

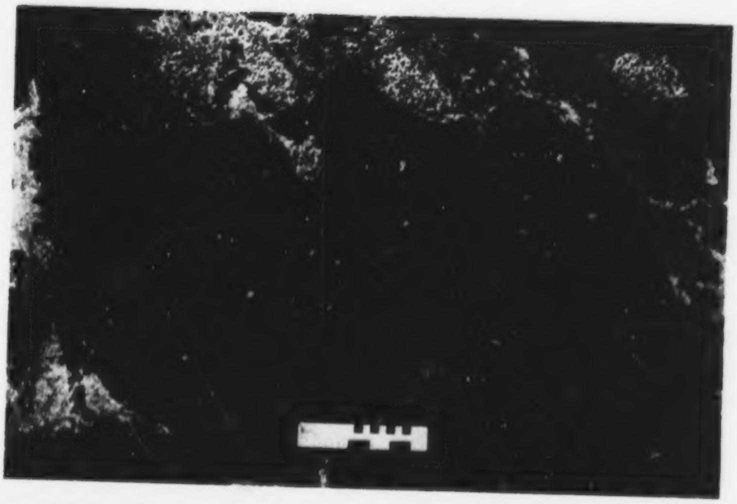
- ■ **Mafic intrusive rocks**
- ▨ **Granodiorite/Diorite/Trondjhemite** (Granitic rocks)
- ○ **Porphyritic/Plutonic** (Granitic rocks)
- ☐ **Massive/Plutonic** (Granitic rocks)
- ░ **Gneissic** (Granitic rocks)
- ▨ **Migmatites/Remnant-Metavolcanic-Metasediments**
- ■ **Metasedimentary rocks**
- ■ **Metavolcanic rocks**
- **Stress fracture zones (observed)**
- **Wanipigow cataclastic zone**


BERENS RIVER SUBPROVINCE
UCHI SUBPROVINCE
MANITOBA
Irwin L.
Miller L.
Roderick L.
Mimi L.
Wagin L.
Kirkness L.
Harding L.
Elizabeth L.
MacGillivray L.
Job L.
Dutch
Thicketwood L.
Subourin
Olive
Barclay L.
Artery
Larus L.
Simeon L.
Young
Linge
Peisk L.
Carroll L.
Indian House
McInnes L.
BALL
FAIRLIE
TODD
RED
Gammon
Bulging
Haggart
Wrist
Mather
Beamish
Leano
Medicine Stone L.
Upper Medicine Stone L.
Rainfall
Deedee L.
Sydney Lake
Pinenut Lake
Eagle
Larus L.
Reignier L.
Odin
Valhalla L.
Rathouse L.
Douglas
Knox

1:600 000

0 10 20 km

North



"Pillowed lava remnants on Irregular Lake. Woodland Caribou Park contains some of the oldest rocks on earth."

"The Wanipigow-Wallace Lakes Fault represents a suture in the earth's crust formed 2.5 billion years ago"

Earth Science

Bedrock Geology

Woodland Caribou Provincial Park lies in the central portion of a vast area of ancient rock known as the Precambrian or Canadian Shield. This Shield forms the foundation of the North American continent and consists of some of the oldest rocks on earth (Fig. 6).

The Shield is divided into a number of provinces and subprovinces based on differences in rock type, structure and age. Woodland Caribou Park is situated in the largest of these, the Superior Province, which extends from Lake Winnipeg in Manitoba to Ungava Bay in northern Quebec. The rocks of the Superior Province were formed between 2.5 and 3.0 billion years ago. The park encompasses portions of two subprovinces, the older Uchi Subprovince in the south and the younger Berens River Subprovince in the north.

The Uchi Subprovince consists of interlinked volcanic belts separated by large areas of granites and granitic gneisses. The park is underlain by one such area of granitic rocks with minor volcanic rocks in the Telescope and Hatchet Lakes area at the eastern park boundary. These volcanics are the western termination of one of the most economically important mineral areas in Ontario, the Red Lake Greenstone Belt. These occur as remnant blocks of volcanic rocks engulfed in granite. This was the result of granitic magma rising through the earth's crust, incorporating blocks of volcanic rocks from the overlying volcanic belts. These blocks, often referred to as roof pendants, fell from the volcanic rocks which formed the roof of the magma chamber. Some rocks found in the southern half of the park are iron- and magnesium-rich varieties of granites called diorites and gabbro. These represent a change in the composition of the magma welling up from below the crust.

The Berens River Subprovince is dominated by a variety of massive granites and layered equivalents called granitic gneisses. It contains a few narrow belts of volcanic and sedimentary rocks as well as more iron- and magnesium-rich varieties of granites such as diorites and gabbros. The sparsity of volcanic and sedimentary rocks is the result of higher vertical uplifting of the Berens River Subprovince during mountain building activity which terminated about 2.4 billion years ago. Subsequent erosion of the Shield resulted in the removal of the upper portions of the volcanic and sedimentary belts to the point where only remnants of the roots of the belts remain. One such belt is located within the park in the Carroll Lake area. As a result of the very deep burial during mountain building, the sedimentary rocks in this area have been subjected to extremely high pressures and temperatures. This results in total recrystallization to produce granitic gneisses, and partial melting to produce migmatites.

Dividing the two subprovinces is a large fault zone known as the Wanipigow-Wallace Lakes Fault. This zone of intense shearing and rock deformation extends from Lake Winnipeg to Indian House Lake in the park. The rock forming minerals in this zone have grinded and recrystallized to form well layered rocks called mylonites. These were also shattered to produce fault breccias. This fault was active about 2.5 billion years ago and represents a suture along which movement of the Berens River and Uchi Subprovinces occured.

Because of the minor extent and nature of mineral-bearing volcanic rocks within the park, the chances of finding economically viable mineral deposits are very low. Mineral collecting in the park would be most successful in areas where the granites are very coarse. These are called pegmatites and occur as dykes and irregular bodies.

Table 5. Sequence of Geological Events of Woodland Caribou Provincial Park.

Years Before Present	Event
	Quaternary
7,500-present	Swamp, lake deposits
1 million-7,500	glaciation; deposition and erosion; only Late Wisconsinan features remain
erosional interval	Early Precambrian
2500 million	formation of Wanipigow-Wallace Lakes Fault; shearing, recrystallization; fault movements
intrusive contact	
2700–2400 million	mountain building activity associated with intrusion of plutonic complexes
	intrusion of plutonic complexes, resulting in migmatization and gneissic rocks
intrusive contact	
	deposition of sediments in shallow basins adjacent to volcanic arcs
fault and conformable contact	
2990–2718 million	deposition of volcanic sedimentary sequences along the linear volcanic island chain that developed along a fundamental fracture system in the Early Precambrian crust

Surficial Geology

The shape of the land surface in Woodland Caribou Provincial Park is the product of 2.5 billion years of erosion. All evidence of depositional events were erased by the time the first glaciers advanced over the continent about one million years ago. The glaciers advanced over a landscape of low, rolling topography not unlike that of today. The ice stripped away existing soil and flora as it gouged and moulded the underlying bedrock. There have been four major glacial periods over the last million years. The soils, glacial features and drainage patterns which exist today in Woodland Caribou Park are primarily the result of the last glacial period, the Late Wisconsinan. During the Late Wisconsinan, which commenced about 23,000 years ago, ice affecting the park area advanced from two main centres of spreading: the Keewatin Ice Centre west of Hudson Bay, and the Labradoran Ice Centre in northern Quebec. Only the features of the last ice movement in the area, by the Labradoran glaciers, are preserved in Woodland Caribou Provincial Park. The dominant features include glacial striae (bedrock scars), thin till deposits, a major recessional moraine, and strong evidence of glacial Lake Agassiz, including lacustrine deposits of sand, silt and clay, wave-cut beach terraces, and large tracts of bare bedrock cleared of debris by lake action. The areas of wave-washed bedrock dominate the park terrain (Fig. 7).

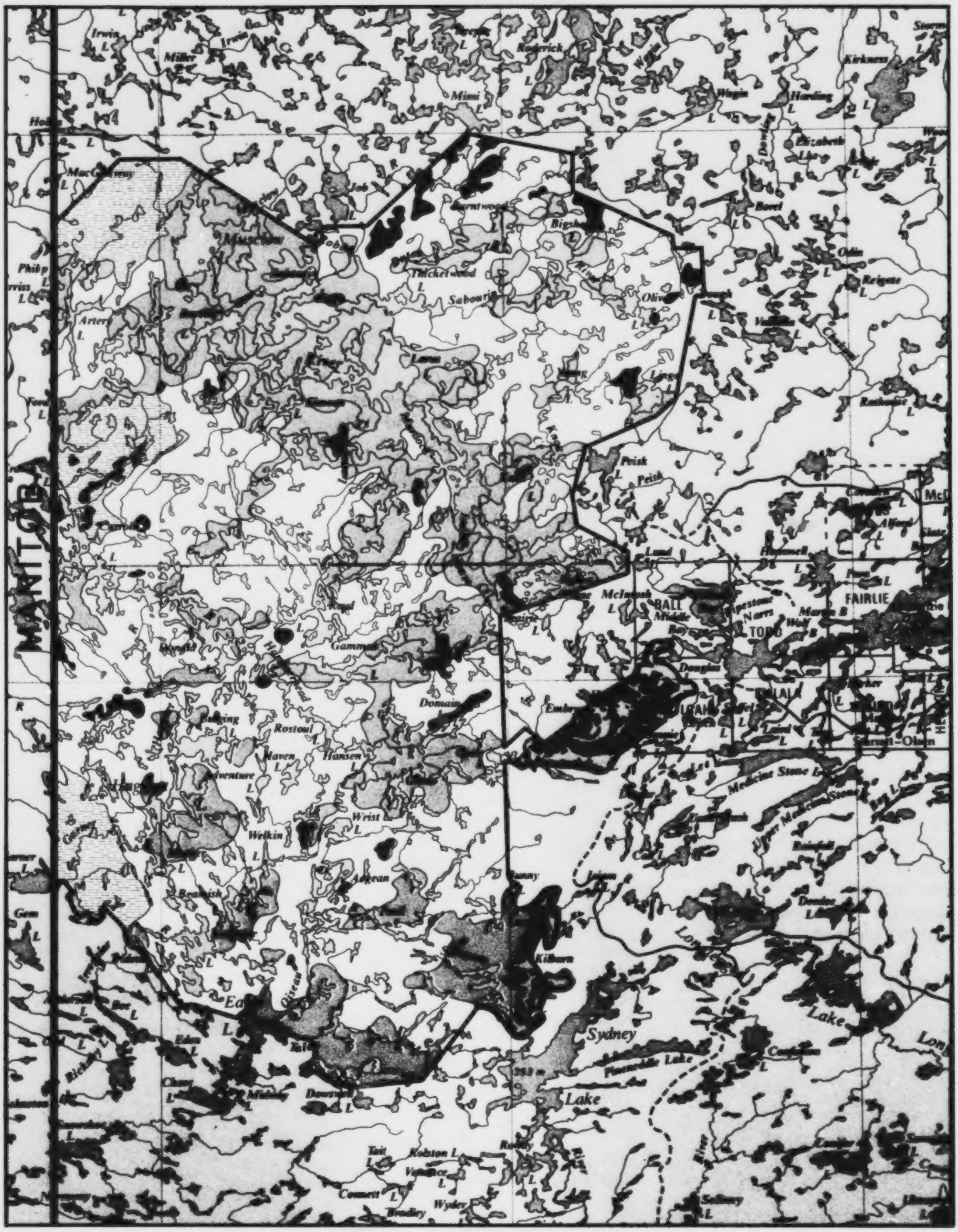
Glacial striae are shallow grooves or scratches gouged into the bedrock surface by rock fragments embedded in the base of the overriding glacier. The striae indicate the erosive power of the glaciers, as well as its direction of movement. Striae in the park are most

Figure 7

Surficial Geology

The thin soils and extensive bedrock evident today is largely the result of glacial Lake Agassiz which completely covered the park some 10,000 years ago.

- ▤ Bedrock — wetland complex
- ▒ Lacustrine silt, clay, and sand deposits
- ■ Subaqueous fan deposits/ lacustrine sand deposits
- ■ Ice contact moraine deposits
- ■ Drift (till) over bedrock
- ▒ Bedrock — drift complex
- ☐ Wave — washed bare bedrock


MANITOBA
Irwin L
Miller
Mimi L
Roderick
Kirkness
Harding L
Wegin
MacGillivray L
Job
Birch
Olive
Philp
Arter L
Rathbone
Prisk
FAIRLIE
McIntosh
BALL
Middle
Pipestone
Narrs
TODD
Margin B
Douglas
Gammon
Domain
Embryo
Rostoul
Haven
Hansen
Adventure
Welkin
Wrist
Bunny
Medicine Stone L
Upper Medicine Stone L
Rainfall
Kilburn
Sydney
Lake
Long
Lake
Tait L
Kobiton L
Cosmett
Bradley
Wyder
Eden
Sydney
Dowswell
Midway
River

1:600 000

0 10 20 km

North

commonly developed on the upstream slope of rock knolls and indicate a single glacial movement from the northeast. On a macro scale, the park exhibits a typical scoured landscape in which ice-moulded bedrock forms, such as whalebacks, stoss-and-lee roche moutonne, and elliptically elongated hills, are characteristic. Particularly well-developed examples are found on Carroll Lake.

Most of the park was free of ice for the last time between 11,700 and 10,800 years ago. As the glaciers melted, the debris embedded throughout the ice was deposited on the land surface as ground moraine. This glacial debris, or till, also makes up the extensive Eagle-Finlayson Moraine at Indian House Lake. This moraine consists of a discontinuous double ridge of sand, gravel and boulders with extensive outwash sand deposits, and represents a major halt in the position of the retreating Labradoran glaciers. Other areas of till, and numerous small kame, cross-valley moraine and ground moraine deposits, survive in discrete localities throughout the park.

The disintegrating edge of the ice-front stood in the waters of glacial Lake Agassiz which extended eastward from the Red River valley to form the largest body of freshwater on the continent. At this time, the outlets for the lake were to the south. Underwater fan deposits of sand were laid down in the deep waters of glacial Lake Agassiz by meltwater issuing from the base of the ice.

"This large sand deposit in the northeast sector provides substrate for the jackpine-lichen forests frequented by caribou"

Beaded, linear sand deposits formed in this way occur in the park near Carroll Lake and the Wanipigow River, and north of Thicketwood Lake. The next phase of Lake Agassiz was marked by rapidly lowering water levels as eastern outlets into the Superior lake basin were cleared of ice about 10,900 years ago.

A glacial readvance of 9900 years ago blocked the eastern outlets once again, causing glacial Lake Agassiz to rise. Near Red Lake, the maximum elevation attained by the lake during this phase was 480 m, well above the highest topography in the park area. Thus, the park was for a time completely submerged by the waters of glacial Lake Agassiz. This submergence resulted in the removal of most debris from bedrock upland areas and the sorting of fine material from remaining deposits by the action of waves and currents. It also resulted in the deposition of lacustrine sands, silts and clays in deeper portions of the lake. In the park, these lacustrine deposits are predominant in the Bloodvein and Gammon River systems.

About 9500 years ago glacial retreat once again opened the eastern outlets into the Nipigon and Superior basins. Rapid lake level changes, with periods of relative lake level stability planed some deposits flat, cut weak beach terraces in others, and deposited coarse material over the fine, deeper-water silts and clays. The northern portion of the park, particularly along the Bloodvein River system, exhibits most of these features particularly well.

During the last, low stages of glacial Lake Agassiz, the present pattern of lakes and rivers in the park area emerged, first as islands in the vast lake, then as fast-flowing rivers and broad lakes in a rocky landscape. Some deep bedrock troughs, particularly in the Young Lake area, provided routes for channelized meltwater flow. The present landscape was established by about 7800 to 7500 years ago and vegetation patterns, similar to those of today, were already being established by this time.

"Large erratic boulders on a moraine near Aegean Lake represent an ice-contact deposit of the retreating Wisconsinan glaciers"

Topography

Woodland Caribou Provincial Park encompasses a bedrock-controlled terrain typical of the Canadian Shield. Gently rolling to locally abrupt rock knolls form a plain which slopes gently to the west and northwest. Fractures and faults in the bedrock create elongate lake systems joined by short drops and few river reaches producing what is known as a "Canaux-et-Lacs" draining pattern.

The southernmost portions of the park represent the greatest variability in topography. The highest point in the park, a rock knoll at over 430 meters above sea level, occurs just west of Kilburn Lake in the southeastern corner of the park. This area contains numerous vertical rock faces over 50 meters high producing the area of greatest relief. The lowest point in the park is the surface of Garner Lake at about 309 meters above sea level. This area of low relief in the southwestern corner contains low bedrock knolls and ridges and one of the highest incidences of wetlands within the park.

Soils

As a result of the park being completely submerged by the waters of glacial Lake Agassiz, large areas of bedrock were cleared of glacial debris. The southwestern and west-central areas of the park are dominated by these areas of wave-washed bedrock. The meagre soil that was left in these areas consists of pockets of sorted tills (mostly sands and gravels) and minor lacustrine sediments (silts and sands). Organic deposits in bedrock troughs are common but generally of minor extent. Large individual boulders known as glacial erratics and boulder fields are locally common.

Deposits of ground moraine (unsorted till containing stones, silts and sands) occur as a thin veneer over bedrock in the Kilburn, Douglas-Telescope, and Eagle Lake areas. Locally, small cross-valley moraines, kames and recessional moraine deposits occur throughout the park. All of these deposits have been modified by the wave action of glacial Lake Agassiz resulting in smoother surface expressions.

Substantial deposits of uniform sand and gravel occur in the Wanipigow River and Domain, Carroll and Hammerhead Lake areas. The largest of these deposits occurs as a broad sandy plain north of the Dutch River in the northeast sector of the park. Although the depth of these deposits probably exceeds 10 meters, numerous bedrock knolls commonly protrude from their flat surfaces.

The most substantial surficial materials occur along the Bloodvein and Gammon River systems. Lacustrine silts dominate these areas, with lesser deposits of sands and clays. These deep deposits rarely mask the underlying bedrock topography which outcrops extensively throughout both river valleys. Drainage is generally imperfect, resulting in an abundance of wetlands and large lakes along both river systems, particularly in the Bloodvein.

Soil development on all deposits is not extensive, with thin podzols predominating. The bare bedrock areas and lacustrine sand deposits are generally nutrient poor, resulting in a limited vegetative diversity. Where finer-grained materials occur, drainage is generally poor, nutrients more abundant, and vegetative diversity greatly increased.

Life Science

The flora and fauna of Woodland Caribou Park have developed subsequent to the drainage of glacial Lake Agassiz. The park area was scoured and washed by ice and water to such a degree that little remained for terrestrial plant and animal life to develop on. Today, the bare bedrock knolls and plateaus are abundant evidence of this influence. Pockets of silt and clay from the great lake offer better conditions for plant development in some areas of the park as do the small, scattered sand plains. In Woodland Caribou Park we see a natural landscape still freshly emerging from those post-glacial times and only just recovering from the major ecological disturbances associated with them.

The landscape of the park is in a very natural state due to the absence of artificial disturbances such as roads, railways and power transmission lines. Development is confined to a number of fly-in lodges, out-post camps and cottages, as well as a small number of trapper's cabins. These appear to be having virtually no impact on the terrestrial ecology of the park. Disturbances include natural phenomena such as fire, insects, and wind storms to which nature has adapted and on which many organisms are dependent for their survival.

"Woodland Caribou Park has one of the highest occurrences of forest fires in Ontario"

Regional Setting

The boreal forest region is a vast band of coniferous forest-dominated landscape that extends across northern Ontario between the largely treeless arctic/subarctic regions to the north and the mixed hardwood and coniferous transition forest region to the south. It is characterized by a cool climate and a low level of biological productivity that, combined with relatively recent emergence from glacial conditions and post-glacial flooding, resulted in the limited biological diversity. Woodland Caribou Park is entirely contained within the boreal forest, and contributes to the representation of the vegetation of Hill's Site Region 4S.

Typical boreal tree species such as jack pine, black spruce, balsam fir and trembling aspen dominate upland sites with black spruce and larch characterizing the wet, organic deposits found commonly throughout in bedrock depressions. Woodland Caribou Park is significantly affected by its proximity to the interior plains of the prairie provinces, which begin less than 50 km to the west. This results in a relatively dry, hot growing season and affects the nature of the vegetation and thus, the flora and fauna of the park. The resulting 'prairie boreal' forests of Woodland Caribou Park are in contrast with the more moist boreal forest in the rest of the province. Consequently, the incidence of naturally occuring forest fires is very much greater here than in any other area of Ontario.

Fire History

Forest fires form an integral part in determining forest communities and providing a mosaic of successional stages found in Woodland Caribou Park. Fires are caused primarily by lightning strikes, but man caused fires are not uncommon.

The number of fire starts in any one year depends on local weather conditions. Over the past 15 year period, an average of 18 fires per season have occurred within the park ranging from one start in 1978 to as many as 57 in 1976. Fire size is dependant on burning conditions (temperature, humidity, wind, etc.) with the two largest fires occuring in 1974 (53,874 ha) and 1983 (24,282 ha). Approximately 20 percent of the park area has burned in the past 15 years (Fig. 8).

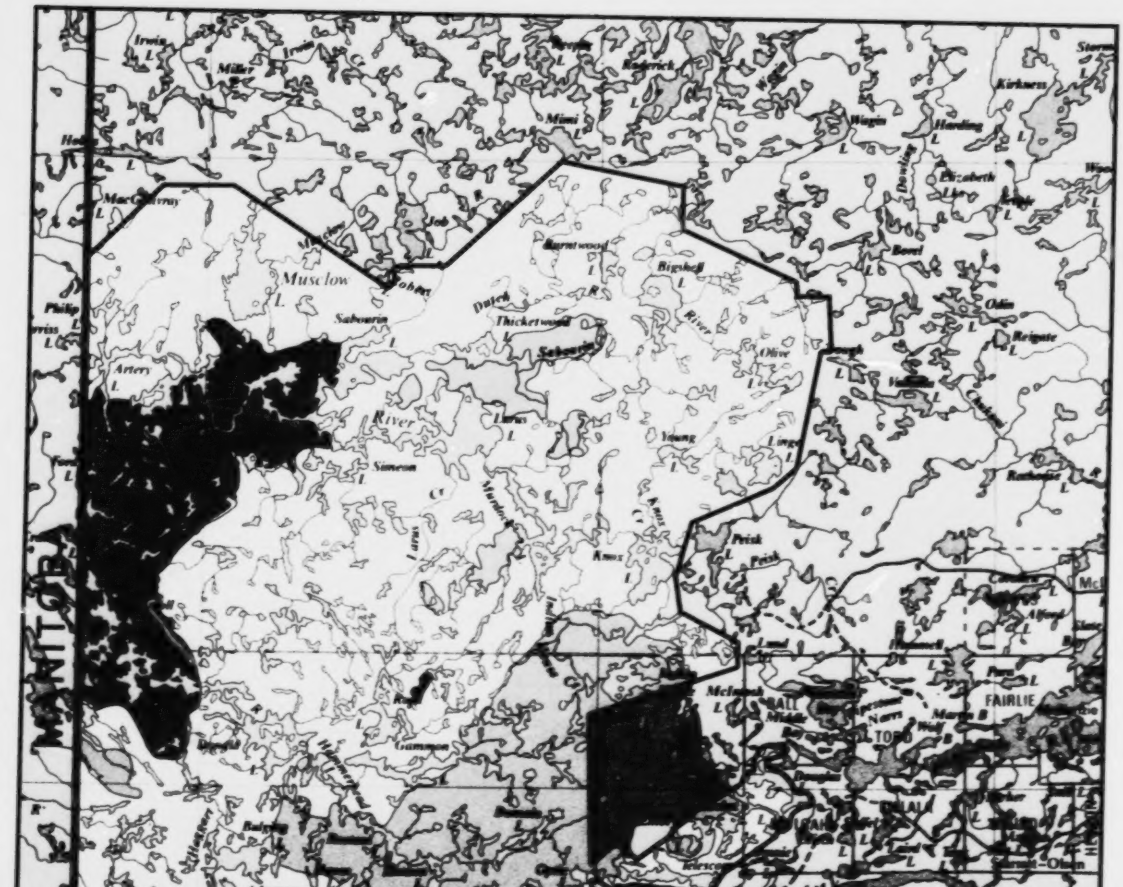
Active fire suppression has been in effect since the 1940's with most fires receiving at least initial attack. Without this suppression effort the fire history would be much different throughout the park. In this sense man has played a role in the forest ecology over the past 45 years.

Figure 8

Forest Fires (larger than 40 hectares)

The hot, dry climate and thin soils combine to produce one the highest fire occurrence areas in Ontario.

- ▢ 1980's
- ▢ 1970's
- ■ 1960's
- ▨ 1950's
- ■ 1940's



MANITOBA
Irvin L.
Miller L.
Mimi L.
Roderick
Kirkness
Harding L.
Elizabeth L.
MacGillivray L.
Job L.
Musclow L.
Sabourin
Burntwood L.
Bigshell L.
Dutch
Thicketwood L.
Sabourin
Philip
Artery L.
River
Olive L.
Odin L.
Reigate L.
Lorus L.
Young
Lings L.
Simeon L.
Rothesay L.
Knox L.
Peisk L.
McIntosh L.
FAIRLIE
Pearl L.
Gammon
Bulging
Adventure L.
Wrist L.
Welkin L.
Medicine Stone L.
Upper Medicine Stone L.
Dowler L.
Sturgeon
Leano
Sydney
Lake
Long
Lake
Eden L.
1:600 000
0
10
20 km
North

"Lowland areas often survive fires creating a mosaic of habitat types"

"Jack pine accounts for 80 percent of the park's forest cover"

Vegetation

Large forest fires have been an ongoing feature of forest regeneration for thousands of years and are essential if the vegetation, and its dependent fauna, are to continue. These early successional forests average well under 100 years of age and will regenerate effectively only after mature forest cover has been burned over. The flora of the park is comprised of species that do best in early successional boreal forests. This is particularly evident with the rare floral species located throughout the park. There are five major categories of vegetation in the park (Fig. 9).

Upland Intolerant Forest

This is by far the predominant forest cover, consisting of shade intolerant, early successional forests in thin soil over bedrock, in lacustrine sand plains and (locally) in alluvial soil along rivers. Fire dependent jack pine and jack pine–black spruce forests are abundant in the driest sites. Mixed forests of these species with trembling aspen, white birch and balsam fir are locally distributed in areas of deeper, more mesic soil, as are deciduous forests of white birch and trembling aspen.

The mixed wood and deciduous forests are found mostly in the Bloodvein River watershed, along eastern Carroll Lake and around Kilburn Lake.

Unforested Uplands

Areas of regeneration following recent forest fires dominate this vegetation. The growth of jack pine seedlings is very lush in many such sites and is associated with a diverse and colourful herbaceous flora. Shrubbery composed of pine and spruce seedlings with juniper, green alder and several species of willow, are predominant. Open rock areas with sparse herbaceous vegetation and lichen encrusted bedrock outcrops with little or no soil in forested areas are also common. This latter type is found throughout burns and pine forests in individual stands too small to illustrate.

Lowland Intolerant Forest

This vegetation is not fire dependent and is, to a large extent, very fire resistant. It dominates wet, organic deposits in bedrock depressions and, to a lesser degree, wet sandy shores throughout the park. Black spruce and black spruce–larch forest is common, even remaining intact in recent burns. These sites are cold and subarctic in aspect. A few small stands of mixed intolerant lowland forest, dominated by balsam poplar and balsam fir, were noted at Aegean and Artery Lakes, occuring on wet lakeshore sand deposits. These sites are more typically boreal in nature.

Figure 9

Vegetation

The proximity of the prairies and the predominance of forest fires have produced the unique "prairie boreal" forest of Woodland Caribou Park.

Upland Vegetation

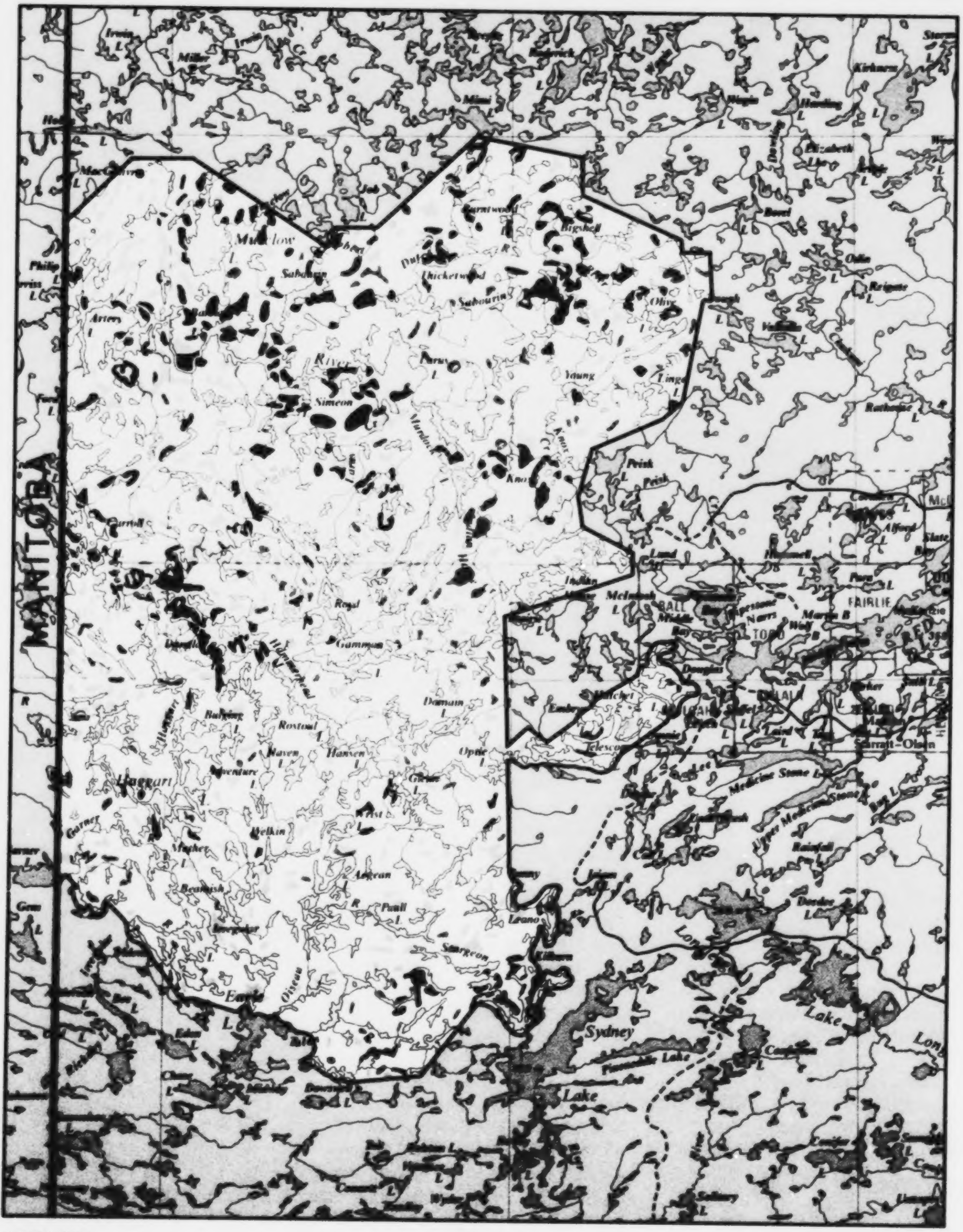
☐ Upland intolerant forest
— coniferous

■ Upland intolerant forest
— mixed and deciduous

Lowland Vegetation

▨ Lowland intolerant forest
— coniferous (bog)

■ Unforested
— heath mat
— open graminoid bog


MANITOBA
Sydney Lake
Medicine Stone Lake
Upper Medicine Stone Lake
Long Lake
Simeon
Haggart
Sabourin
Royal
Gammon
Knox
Young
Olive
Telescope
Leano
Eagle L
Sturgeon

1:600 000

0 10 20 km

North

''Hardwood forests occur on deeper, richer soils along the Bloodvein River''

''Lush jack pine regeneration in the 1983 Irregular Lake burn

Unforested Lowland
A complex of wetland shrub and meadow vegetation types is found throughout the park in flooded bedrock depressions, along streams and rivers and on quiet lakeshore flats. It is made up of four major vegetation types:

(a) *Wetland Thicket*
Speckled alder, dwarf birch, several willow species, and other deciduous shrubs border most wetland areas, especially river shores and bog margins. Although abundant, it is found in individual stands too small to illustrate.

(b) *Wetland Meadow*
Extensive fern-like meadows dominated by grasses and sedges occur locally on somewhat mineralized peatlands along quiet river shores throughout the park. Floristic diversity is quite low in these meadows which support a number of more typically southern and eastern peatland species.

(c) *Open Graminoid Bog*
Open, thin mats of sphagnum moss dominated by sedges and other herbaceous plant species are found in association with many heath mats in discreet, small sites. A few rare cases of patterned bog mats are known in the area (near Olive Lake and just north of the park by Embryo Lake). This cold, wet situation is arctic/subarctic in aspect.

(d) *Heath Mat* Acidic, organic mats of older, relatively drier peat dominated by leatherleaf, labrador tea and other ericaceous shrubs are typical of this common vegetation type in the park. It is often found in quaking bogs and is old and subarctic in character.

Aquatic Vegetation
A very complex set of associations of floating and submerged aquatic plants, as well as emergent flora, dominate quiet bays, stream margins and bogs throughout the park. Open water aquatics are very common and occur in all lakes and rivers in the park. Marshes occur locally on silt and sand in shallower water along streams and in lake bays in fresh water. Cat-tail, bur-reed and wild rice dominate marshes within the park. The latter is particularly common near Carroll and Indian House Lakes.

Significant Vegetation
Woodland Caribou Provincial Park contains a number of prairie plant species in association with large, very dry jack pine—bedrock forests. This "prairie boreal" vegetation is not represented elsewhere in the Ontario provincial parks system. Since only a small portion of the province can even potentially support such vegetation and considering the vast extent of it in the park that is in a pristine state, the vegetation can be considered to be provincially and possibly nationally significant. This vegetation supports a number of life science features known from nowhere else in Ontario and is critical to the woodland caribou population in the park. In addition, the sedge meadows and the lowland balsam fir–balsam poplar stands support a variety of rare and/or unusual flora and fauna and are of regional significance.

"Prairie Spikemoss (Selaginella densa) on Carroll Lake. First record for this species in Ontario."

Flora

The vascular flora of Woodland Caribou Park is unusually rich for a northern area with such limited habitat variation. During 1985 field studies, the status and distribution of 418 taxa of vascular plants were determined in the park. This total includes those species collected by the Royal Ontario Museum botanists who collected along the Bloodvein River in July and early August.

Floral Affinities

The majority of species of plants in Woodland Caribou Park are found regularly across Ontario's boreal forest and over 13 percent are characteristic of this region. Elements of other floristic regions in North America were evident as well. An interesting aspect of the flora here is the remarkably low number of introduced, non-native species (weeds). Virtually all were found about the lodge buildings or at regularly used fly-in campsites. Less than one percent of the total park flora consists of weed species found growing in natural habitats. That figure compares strikingly with the 30 percent one might expect in more accessible areas of northern Ontario and over 40 percent encountered in developed southern Ontario. It offers strong evidence of the ecological integrity of the park area.

Species typical of the dry prairie regions and prairie forest lands west of Ontario make up over 4.5 percent of the park flora, the largest non-boreal element in the flora. This includes several very rare species for Ontario and supports the labelling of park forest lands as prairie boreal. A sizeable transition forest floristic element is represented in the park (3.5 percent of the total) while two percent of the floral species are typical arctic/subarctic plants and these are all wetland species. A similarly low representation from the more moist boreal/transition area east of Lake Superior was noted, an expected situation given the distance and environmental difference of these areas. Most of these species are aquatics.

Floral Significance

Twelve plants within Woodland Caribou Park are provincially rare (Table 6). In the case of the prairie spikemoss, which was found for the first time in Ontario during this study, the entire known provincial range of the species is within the park boundaries. Similarly, more stations for parsley fern, prairie rush, Vasey's rush and floating marsh-marigold are known from Woodland Caribou Park than from all other areas of Ontario put together. The prairie crocus station represents only the second Ontario record and is the first in at least 25 years.

Other than from a few incidental collections near Aegean Lake in 1958 and at Gammon River in 1974, there was virtually no botanical information on the park prior to this study. The botanical data collected during the study, therefore, is particularly significant as it represents the most comprehensive botanical assessment of any area between the English River and the Hudson Bay Lowlands in northwestern Ontario. Over 100 park records represent the northernmost range limits in the province for those particular species. A number of these, however, would be surpassed by the results of additional studies north of the park in areas where few or no botanical investigations have been undertaken.

Table 6. Provincially Rare Plants within Woodland Caribou Provincial Park.

Common Name	Scientific Name	Affinity	Significance
Prairie Spikemoss	*Selaginella densa*	Prairie	Provincial First record for Ontario
Ten-Flowered Showy Goldenrod	*Solidago nemoralis* var. *decemflora*	Prairie	Provincial First record for Ontario
Prairie Rush	*Juncus interior*	Prairie	National Rare in Canada
Prairie Crocus	*Anemone patens*	Prairie	Provincial Second record for Ontario. First in 25 yrs.
Vasey's Pondweed	*Potamogeton vaseyi*	Eastern & Southern	Provincial
Farwells Millfoil	*Myriophyllum farwellii*	Eastern & Southern	Provincial
Alwort	*Littorella americana*	Eastern & Southern	Provincial
Coontail	*Ceratophyllum echinatum*	Eastern & Southern	Provincial
Parsley Fern	*Cryptogramma crispa*	Western Boreal	Provincial
Floating Marsh Marigold	*Caltha natans*	Western Boreal	Provincial
Vasey's Rush	*Juncus vaseyi*	Boreal	Provincial
Narrowleaf Sundew	*Drosera linearis*	Boreal	Provincial

Diseases and Insects
A serious attack of jack pine budworm affected the Carroll and Artery Lakes area in the summer of 1984. By 1985, the budworm had infested 90–100 percent of the jack pine stands in the park causing 4.5 percent mortality. While the the trees can survive two years of infestation, a third year could cause widespread mortality producing a very high risk of forest fires.

A major blowdown, two km wide, occurred in the park in 1974 and extended 30 km from Aegean Lake to Telescope Lake.

Wild Rice
Wild rice is the only plant harvested from Woodland Caribou Park. There are nineteen licensed areas located within the park (Fig. 10), but only an average of four are harvested in any one year. Eight of these licenses have not been worked since 1979.

The volume of rice available depends on weather and water levels, however, there are no water control structures located within the park. Annual production has varied over the past six years from a low of 250 kg in 1982 to 13,890 kg in 1981. Most harvest areas represent introduced stands of rice, with only Musclow and Prairie Lake areas being natural in origin.

Harvesting is done by mechanical harvesters in most instances and occurs over a very short period at the end of August.

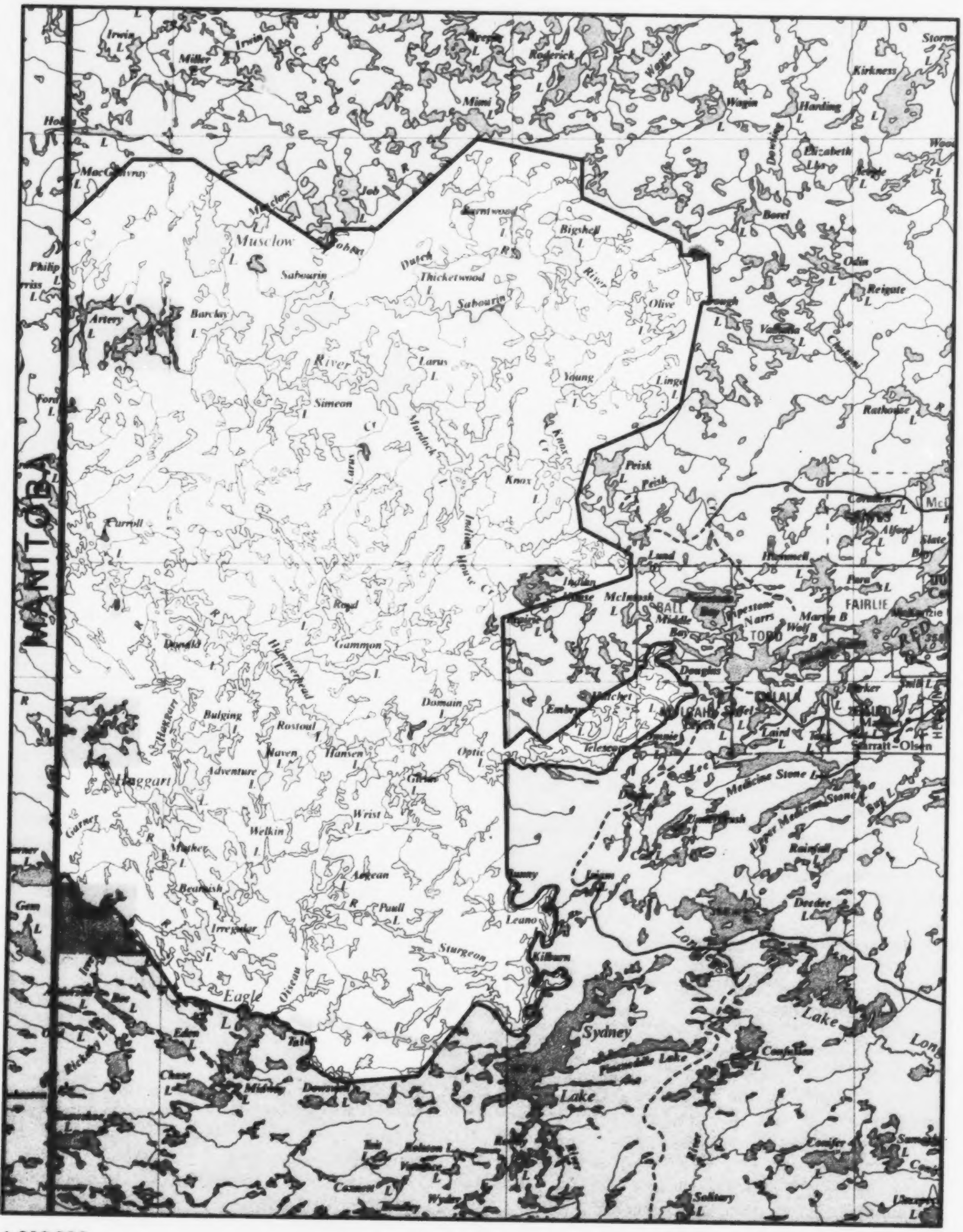
Value of production has varied from a low of 876 dollars in 1982 to 53,587 dollars in 1981, an extraordinary rice year. On an average year the rice crop within the park generates only 10,000 dollars. In this regard, it would appear that harvesting wild rice from Woodland Caribou Park is a supplementary income source for most harvesters.

Figure 10

Wild Rice Harvest Areas

On average only four of the nineteen wild rice licence areas are harvested in any one year.

□ Wild rice harvest areas


MANITOBA
Irwin L.
Miller L.
Roderick L.
Mimi L.
Wagin L.
Kirkness L.
Harding L.
Elizabeth L.
MacGillivray L.
Job L.
Musclow L.
Barnwood L.
Bigshell L.
Borel L.
Odin L.
Sabourin L.
Thicketwood L.
Olive L.
Reigate L.
Artery L.
Barclay L.
River
Larus L.
Young L.
Simeon L.
Rathouse L.
Peisk L.
Knox L.
Carroll L.
Lund L.
Hammell L.
Alford L.
Slate Bay
McIntosh L.
Indian House L.
Middle Bay
Pipestone Narrs
FAIRLIE
BALL
TODD
Martin B
Wolf B
McKenzie
RED
Donald L.
Gammon L.
Domain L.
Douglas L.
Hatchet L.
Bulging L.
Rostoul L.
Haggart L.
Haven L.
Hansen L.
Optic L.
Telescope L.
Laird L.
Sharratt-Olsen
Adventure L.
Medicine Stone L.
Upper Medicine Stone L.
Wrist L.
Welkin L.
Mather L.
Beamish L.
Rainfall L.
Paull L.
Irregular L.
Leano L.
Deedee L.
Sturgeon L.
Kilburn L.
Eagle L.
Oiseau
Long Lake
Sydney Lake
Piscoodle Lake
Confusion L.
Eden L.
Chase L.
Midway L.
Downess L.
Lake
Rickey L.
Conifer L.
Solitary L.

1:600 000

0 10 20 km

North

Fauna

Faunal Affinities

The character of the fauna of Woodland Caribou Park appears to be similar to that shown by the flora, including a wide variety of species that are found across the boreal region of Ontario, with lesser elements from other biotic regions. No alien vertebrates (such as starling, house mouse, etc.) were noted in the park, further attesting to the park's ecological integrity.

Typical boreal species in Woodland Caribou Park include large mammals such as woodland caribou, moose and black bear, and furbearers such as beaver, otter, muskrat, mink, fisher, marten, weasel, lynx, fox and timber wolf. Non-game boreal fauna include such species as mink frog, three-toed woodpecker, merlin, Connecticut warbler and boreal chickadee. The prairie influence in the park's fauna is indicated by the presence of such species as Franklin's ground squirrel, Forster's tern, white pelican and red sided garter snake. Stations for green frog, snapping turtle, muskellunge, raccoon, eastern garter snake and pine warbler suggest a minor influence from the more southern transition forest region.

Faunal Significance

Mammals

The woodland caribou population within the park is considered to be provincially significant. This species has very specific habitat requirements which are found in few other places in Ontario. The Franklin's ground-squirrel colony suspected near Carroll Lake would prove to be one of the few localities for this mammal in Ontario and the most northern station in the province.

Birds

Of the approximately 100 species observed during the breeding season in Woodland Caribou Park, most are considered to be typical of the boreal regions of Ontario. Several unusual records were noted however. White pelicans were seen on Simeon, Artery and Musclow Lakes, but all three may well represent post-breeding (or non-breeding) wanderers. Two Forster's terns at Larus Lake may have represented a breeding pair—previously unreported as a breeder in northwestern Ontario.

Fish-eating birds such as common loon, great blue heron, bald eagle and osprey were observed in relatively large numbers throughout the park. There are numerous nesting locations but only a fraction of these have been documented.

Amphibians and Reptiles

Herpetological investigations in this part of Ontario are very few and so all park records are of significance. Several records were particularly notable representing new northern range extensions. This applies to green frog, snapping turtle and painted turtle records from the park. The red-sided and eastern subspecies of the common garter snake both occur in the park, the only area in which this overlap in ranges is known. That situation is of considerable bio-geographical interest.

Caribou
Since the turn of the century, human activities have continued to encroach on woodland caribou range, causing their numbers to decrease across Ontario. A large herd near Irregular Lake was first identified shortly after the Second World War, and it was largely because of these animals that a park concept evolved.

Caribou Range

Winter

Aerial transect surveys were flown to identify areas where woodland caribou may concentrate within the park. These animals congregate in herds during winter to increase their chances for survival, and this seasonal gregarious behaviour allows tracks in the snow to be detected from aircraft. The entire park area was surveyed and a distinct distribution pattern emerged (Fig. 11).

Important woodland caribou wintering areas occur in three regions. The largest is situated in the extreme northeast corner near Bigshell Lake. This area was previously identified during the 1978 West Patricia surveys and was a major factor in determining the park's northeast boundary.

A second area of winter concentration is located in the centre of the park around Royd Lake. This area, along with the third zone to the south near Welkin Lake, represents the region originally used by the Irregular Lake herd in the late 1950's. Prominent changes that have occurred since original work are two large forest fires, one in 1974 and the other in 1983. At no time during the 1985 survey was caribou movement observed between winter ranges. This factor, along with the aversion of caribou to enter the recent Irregular Lake fire, suggest that large forest fires are effective barriers to caribou travel within the park.

"Bald eagle, an Ontario endangered species, is common within the park"

V. CRICHTON

"Caribou concentrate on the ice in late winter producing distinctive track patterns"

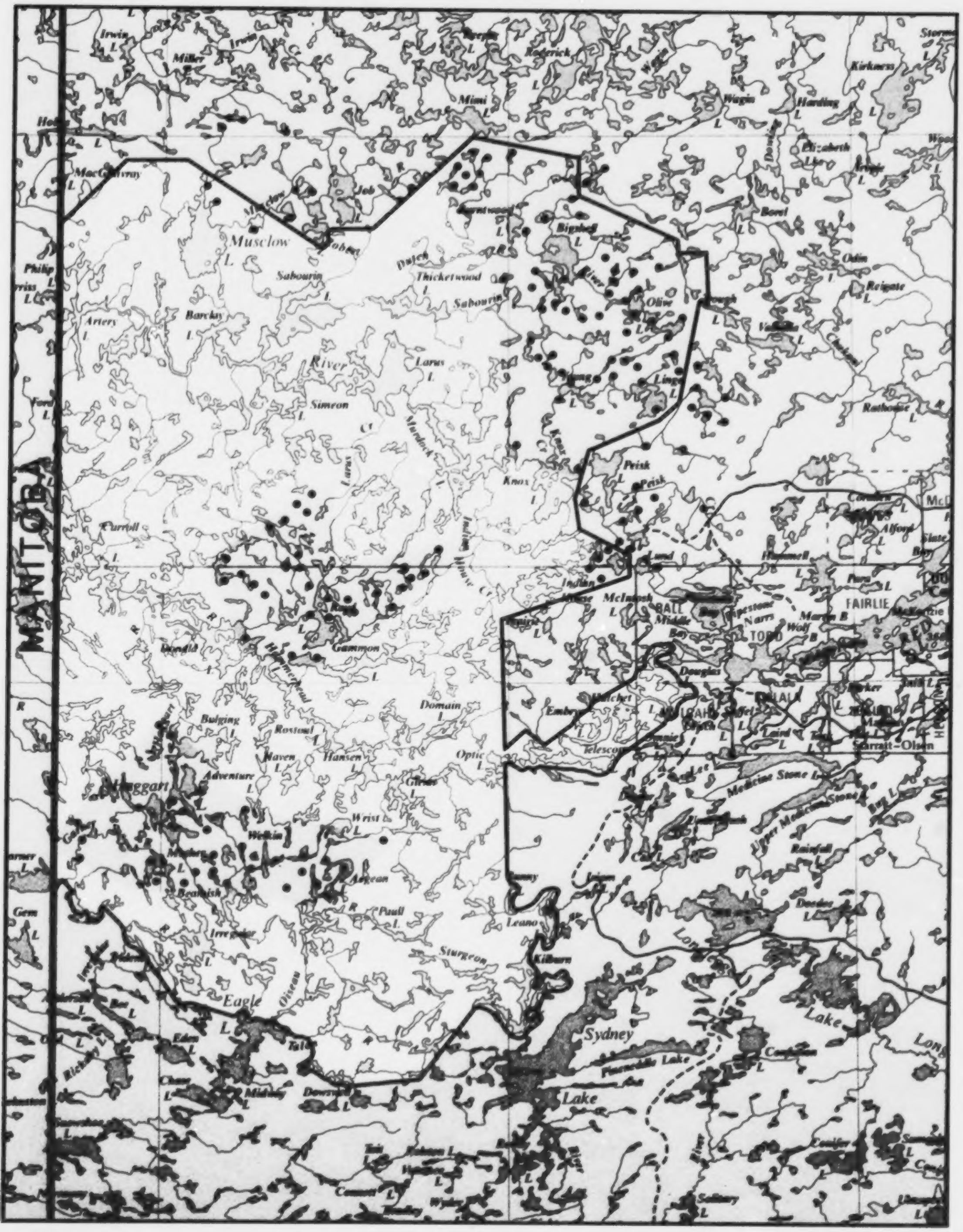
Figure 11

Woodland Caribou Winter Distribution

There is a strong correlation between caribou sightings and the distribution of mature jack pine within the park.

● Track sightings

▨ Extent of winter range


MANITOBA
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Elizabeth
MacGillivray
Job
Bigshell
Musclow L
Sabourin
Thicketwood
Sabourin
Olive
Odin
Reigate
Philip
Artery
Barclay
River
Larus L
Simeon
Ling
Rathouse
Murdock
Knox
Peisk
Carroll
Alford
Hammell
Indian House
McIntosh
BALL
Middle Bay
TODD
FAIRLIE
Gammon
Domain
Bulging
Rostoul
Haven
Hansen
Optic
Telescope
Medicine Stone L
Upper Medicine Stone
Adventure
Wrist
Aegean
Rainfall
Paull
Irregular
Leano
Kilburn
Sturgeon
Eagle L
Sydney Lake
Piccadilly Lake
Eden
Midway
Longlegged Lake
Douglas
Embryo
Starratt-Olsen
Gem

1:600 000

0 10 20 km

North

"Woodland Caribou have specific habitat requirements which are available few places in Ontario"

Summer

Dispersal from winter concentration areas does not appear extensive. All summer caribou sightings occurred in previously defined winter areas or areas immediately adjacent to them. Female caribou select isolated calving islands in spring, which may be an attempt to avoid predators.

During the summer, woodland caribou distribution is not restricted by food availability, as these ungulates demonstrate a generalist feeding behaviour. Readily available succulent plants, forbes and deciduous leaves as well as lichens form their summer diet.

Caribou Density

Winter concentration areas were flown to estimate caribou density within the park. Approximately 65 percent of their winter range was covered and this provided an estimate of 0.05 caribou per square kilometer. Comparison with previous surveys suggests that caribou densities have remained relatively stable over time.

Although density estimates appear similar, the total area of caribou habitat has decreased. Forest fires have removed large sections of habitat once used for important wintering grounds, and, as a result, fewer caribou than originally anticipated are maintained in the park. Current estimates place the total population at less than 120 animals. This small population, combined with the limited reproduction and sensitivity to habitat change and predation, further attest to the fragile nature of this important resource.

K. LAWS

"Lichen mats on bedrock and sand are an important food for caribou"

Caribou Habitat

A strong correlation exists between caribou range and the distribution of 60 to 100 year old jack pine forest throughout the park (Fig. 12). Field investigations confirmed that ground and arboreal (tree) lichens are the main source of food for caribou during winter.

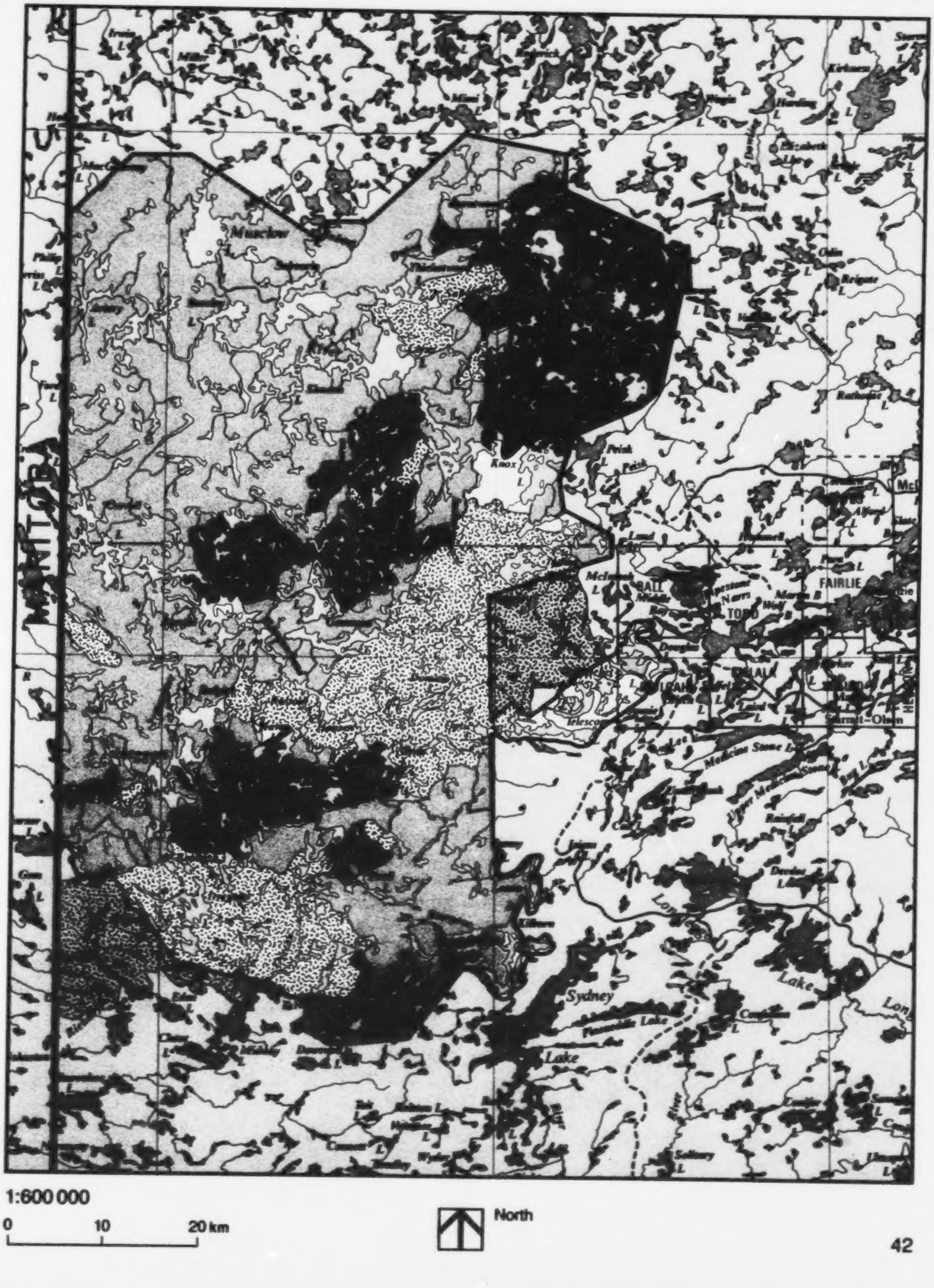
Lichen ecology is not well documented, but available information suggests that lichen has stringent growth requirements with light and moisture being the most limiting factors. As a forest becomes mature (60–100 years), proper combinations of light and humidity at the forest floor allow for maximum lichen production. Once the forest becomes overmature (100+ years), several changes can occur. Blowdown or forest fires may start the system over again, or spruce and balsam may be the next tree species to dominate. Under either of these possibilities, light and moisture conditions do not favour lichen growth.

Figure 12

Jack Pine Forest Age

Mature jack pine stands provide favourable growing conditions for ground lichens that serve as an important winter food for woodland caribou.

- ▨ 20-60 years
- ■ 60-100 years
- ▒ 100 + years
- □ Spruce forest
- ░ Recent fires


MANITOBA
Knox L.
FAIRLIE
TODD
Telescope
Medicine Stone L.
Sydney Lake
Long Lake
1:600 000
0
10
20 km
North

The amount of lichen forming ground cover under jack pine stands of different ages were quantified as part of the life science summer field investigations. Lichen production was greatest under forest cover frequented by caribou during winter.

Caribou have evolved in a mature forest environment where plant and animal diversity is generally low. Fire remains the sole reason for different plant successional stages, and caribou in the past could move to adjacent areas when part of their range was burned. This option, however, is becoming less available because of timber harvesting activities and large forest fires in surrounding areas.

The current habitat mosaic found within park boundaries is a result of fire suppression over the past 45 years. Maintaining that mosaic to provide for the continuance of caribou habitat will be a key factor in determining a fire management strategy for the park.

Moose

Moose are the only other ungulate, apart from woodland caribou, that live in Woodland Caribou Park. Large zones of uniform vegetation found throughout the park do not normally maintain large populations. In this regard, the park area represents marginal habitat capable of supporting only isolated pockets of relatively high moose density.

Moose Density

Woodland Caribou Park is completely enclosed within Wildlife Management Unit #2 and accounts for 35 percent of the unit's total area. Aerial moose inventories have been conducted within WMU #2 at regular intervals and data are considered to be representative for the park.

The moose population of WMU #2 was relatively stable for a six year period between 1977–82, and then increased over the past three years (Table 7). Approximately 390 moose were believed to have lived within the park boundaries in 1982, increasing 48 percent to the current 1985 estimate of 580 animals.

Table 7. Moose Densities within Wildlife Management Unit #2.

Survey Year	Unit density (Moose/ square km)	Estimated Number of Moose
1985	0.13	1675
1982	0.09	1127
1979	0.09	1150
1977	0.09	1171

Areas of high to medium density occur along the Bloodvein River and in the easternmost reaches of the Gammon River corridor. More than 50 percent of the park area is considered low density, particularly in the zones surrounding Bigshell and Royd Lakes, and the south sector (Fig. 13).

Moose Habitat

Moose densities are a reflection of habitat quality and, overall, few areas of the park are considered prime moose habitat. Moose depend on early successional stages of vegetation to provide sufficient browse and therefore they often frequent areas of recent burns (2–20 years). Good moose habitat also occurs in areas of deeper, richer soils where plant diversity is greatest.

These richer soils occur along the Bloodvein River where hardwoods supply a diverse habitat with abundant browse. The region near Gammon River maintains a high population largely because of regeneration associated with the 1974 burn. In general, moose populations within Woodland Caribou Park are maintained by the occurance of fire, as there are few pockets of sufficiently deep and rich soil to provide adequate plant diversity.

The three major zones of low moose density occur in even age jack pine stands considered to be prime caribou habitat. It would appear that the habitat of these species is mutually exclusive but the park area as a whole appears capable of maintaining both ungulates. Distribution of both moose and caribou can be expected to change over time as fires continue to alter habitat conditions.

Figure 13

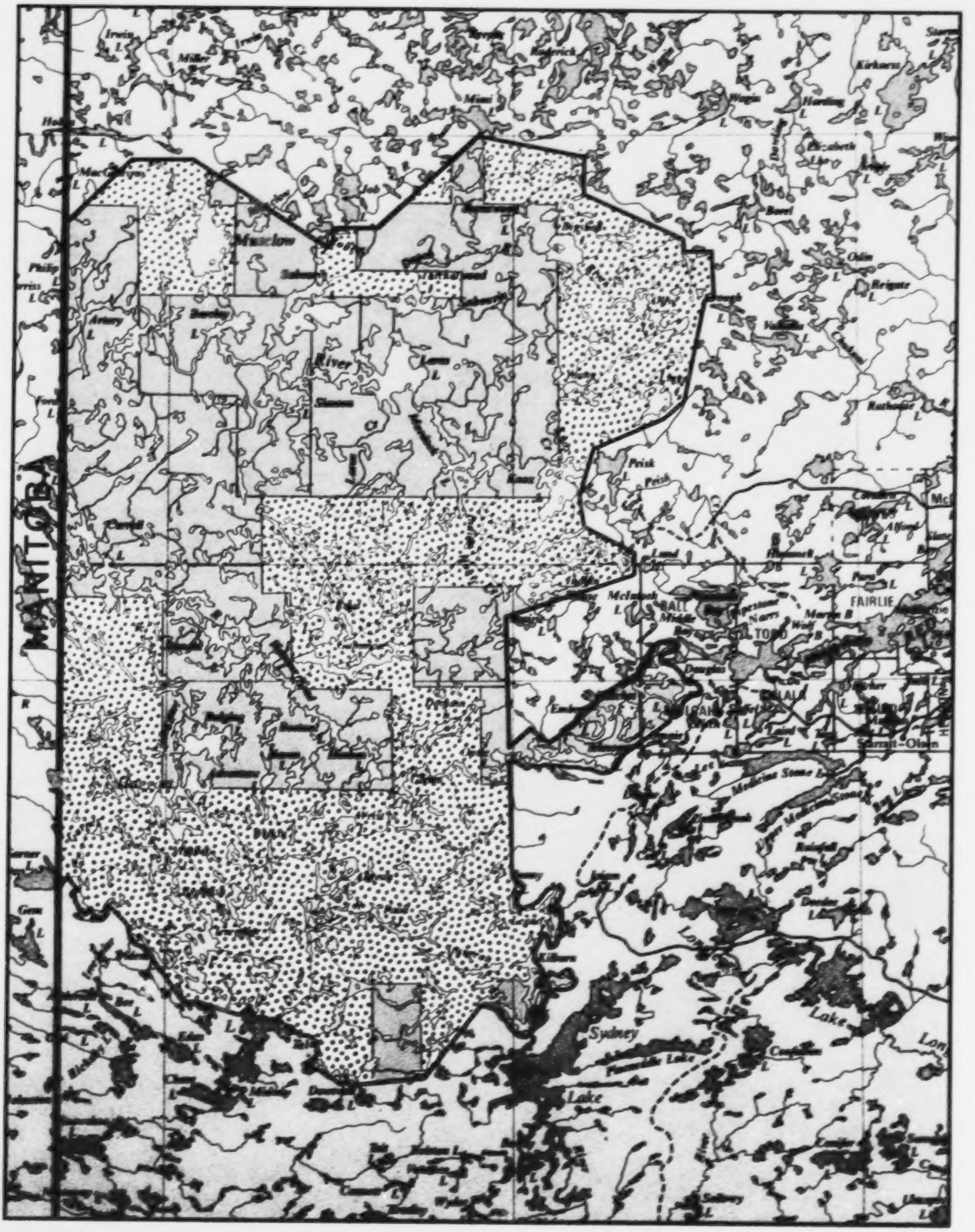
Moose Densities

The richer soils of the Bloodvein River and regeneration associated with recent burns combine to produce isolated pockets of good moose habitat.

▨ ≥ 0.16 moose/square kilometer

▩ 0.06–0.15 moose/square kilometer

⁘ ≤ 0.05 moose/square kilometer



MANITOBA
River
Prisk L
FAIRLIE
Medicine Stone L
Sydney
Lake
Sydney Lake
1:600 000
0
10
20 km
North

"The park provides opportunities for a high quality wilderness hunt"

Moose Hunting
Moose hunting has occurred within the park for decades. During the late 1970's, annual harvest levels were approaching 12 percent of the estimated moose population. This harvest was considered to be near maximum for Wildlife Management Unit #2.

Since 1979, the number of animals removed annually by hunting has declined to approximately eight percent of the population. This decrease is a result of new regulations introduced to control the level of harvest as well as increased costs associated with fly-in hunting trips. The new selective harvest system currently limits total annual harvest to a maximum of nine percent, but concentrated effort still remains in the more developed areas along the Bloodvein and Gammon Rivers.

Hunter success remains high with 70 percent of the adult validation tags being filled each year. Approximately 55 percent of the annual harvest is attributed to non-residents who use the services of tourist camps within the park.

W. DARBY

"Carefully regulated trapping provides a secondary income for 46 trappers"

Furbearers
Fur trapping has occurred within Woodland Caribou Provincial Park for centuries and has contributed a great deal toward Ontario and Canadian heritage.

Furbearers within the park include beaver, muskrat, otter, mink, fisher, marten, weasel, lynx, fox, coyote, wolf, raccoon, squirrel and black bear. Trapper harvest and income is largely dependant on market conditions, trapper effort and animal densities.

The park is divided into five management areas. These are groups of traplines which were historically trapped by individual Indian bands. These areas serve as fur management and administrative units and are subdivided into individual traplines (Fig. 14).

Woodland Caribou Park encompasses 12 entire traplines with an additional eight traplines being partially located within the park boundaries. An average of 46 trappers are involved in the harvest with approximately one half of these being Treaty Indians. Trapping effort and fur production varies considerably from line to line and from year to year, however, all traplines have been trapped at least once in the past six years.

Most trappers maintain at least one cabin for access to their trapline. Use of these cabins is restricted to fall and winter when most trapping activity takes place. Due to the size of the traplines, travel by snowmobile is essential to provide access to the entire line. Trapping trails, maintained in the winter months, frequently act as portage routes between lakes for use by summer visitors.

Figure 14

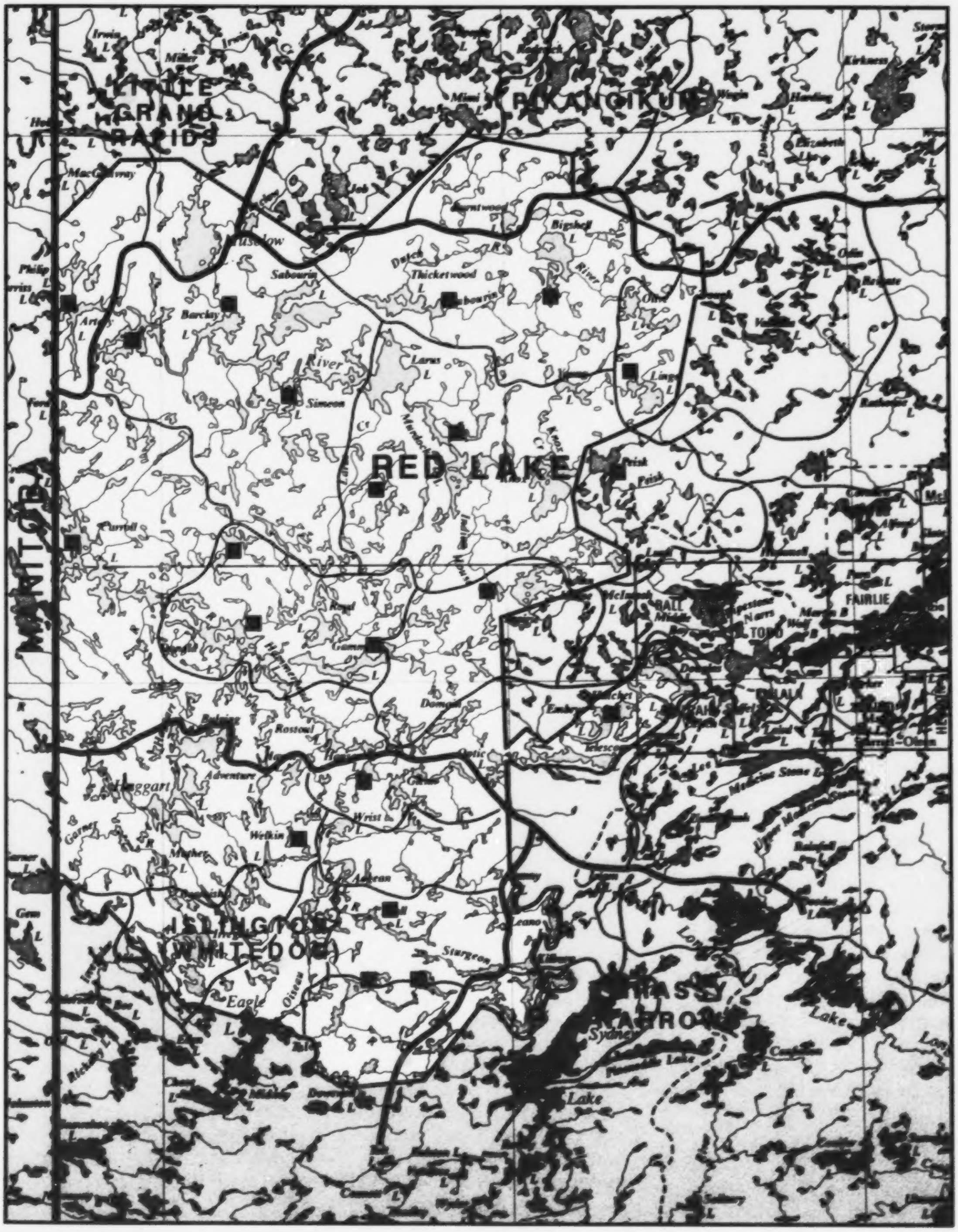
Registered Traplines

Winter fur trapping has been an activity within Woodland Caribou Park for centuries.

Management area boundary

Trapline boundary

■ Trap cabin


LITTLE GRAND RAPIDS
PIKANGIKUM
RED LAKE
MANITOBA
ISLINGTON (WHITEDOG)
TROUT LAKE
FAIRLIE
BALL
TODD
GRASSY NARROWS
Sabourin
Barclay
Simeon
Larus
Thicketwood
Bigshell
Burntwood
Carroll
Royal
Gammon
Dome
Rostoul
Haggart
Adventure
Welkin
Wrist
Aegean
Sturgeon
Eagle
Oiseau
Medicine Stone L
Lake
Sydney
Mather
Garner
Gem
Job
Mimi
Irvin
Miller
MacGillivray
Philip
Artery
Odin
Kirkness
Harding
Elizabeth
Embryo
Telescope

1:600 000

0 10 20 km

North

"Predation is a major factor limiting caribou population growth"

Annual harvests average 1,925 pelts which are divided unequally among the various furbearers. While beaver and muskrat together account for 54 percent of annual yield, they represent only 18 percent of revenue generated in 1984. In contrast, fisher, marten and lynx account for only 23 percent of the harvest but represented 63 percent of the value of the 1984 harvest.

Beaver are generally easily trapped relative to other furbearers and are the only species under quota management. Quotas are determined by periodic aerial surveys of live beaver houses and are used to ensure proper management and to sustain trapper effort. Trappers are required to harvest a minimum of 75 percent of their assigned quota each season.

Economic return from trapping fluctuates between years due to market prices and trapper effort. Gross value of production from all traplines within Woodland Caribou Park after the 1983–84 season was $71,880.00, averaging $3,600.00 per trapline. Income from individual traplines varies considerably and represents a supplementary income for most trappers.

In terms of the resource itself, beaver surveys conducted throughout the park indicate a gradient in beaver production from north to south. Average beaver densities range from a high of 0.16 active beaver lodges per square km along the Bloodvein River to a low of 0.08 in the south sector. This is a reflection of the habitat as evidenced by the greater amount of mixed wood and deciduous forest within the Bloodvein River watershed.

Information regarding other fur bearing animal populations are not well known. Species such as lynx follow regular density cycles closely tied to the natural prey population of snowshoe hare. Others, like the timber wolf, are associated with the status of the moose and caribou populations. Species such as fisher and marten are dependant on prey populations that require mature forest habitat. Under such dynamic natural changes trappers must be aware of changing conditions on their traplines.

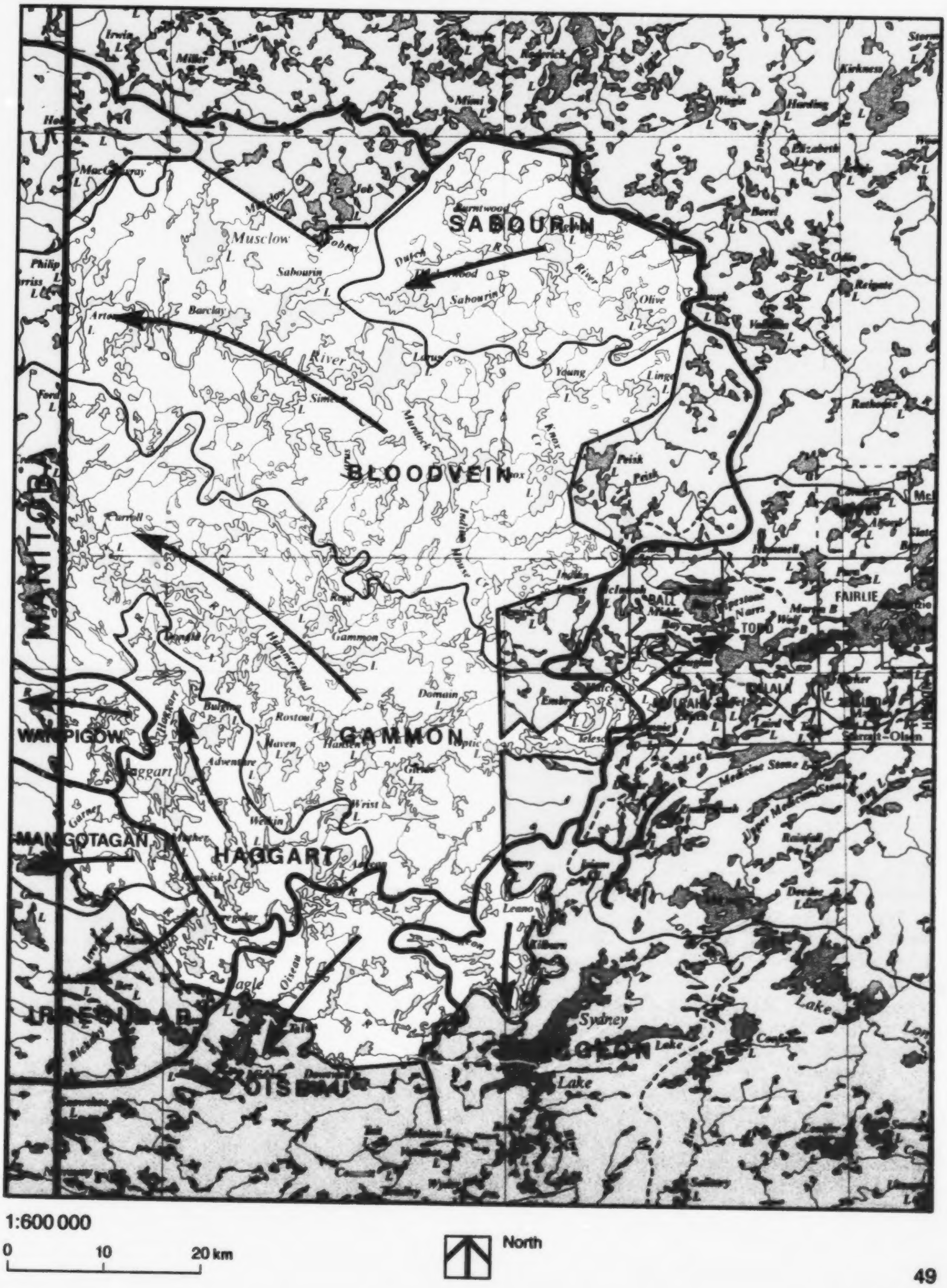
Trapping has the potential to influence other wildlife populations within the park. For example, woodland caribou populations can be affected by wolf densities which are related to wolf trapping activity. Other management such as fire suppression has potential to influence forest habitat and this will have implications for species such as fisher and marten which prefer mature forest. Comparisons of fur production to changes in forest cover may provide opportunities to learn about furbearer response to habitat change. In time, this knowledge will aid in the management of furbearer populations throughout the remainder of the province.

Figure 15

Watersheds

Water originates primarily from within the park and flows south or west to Lake Winnipeg and eventually to Hudson Bay.

▬	Tertiary watershed boundary
─	Quaternary watershed boundary
↗	Direction of water flow


SABOURIN
BLOODVEIN
GAMMON
HAGGART
WANIPIGOW
MANIGOTAGAN
MANITOBA
FAIRLIE
Musclow L.
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Barclay
River
Young
Olive
Domain
Rostoul
Bulgin
Adventure
Haggart
Sydney
Lake
1:600 000
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20 km
North

Fisheries

Watersheds

Woodland Caribou Park lies entirely within the Nelson River Drainage basin where all water flows into Hudson Bay via Lake Winnipeg and the Nelson River. Most headwaters are contained within the park's boundaries which provide a desirable situation where water flow originates from within the park and travels out. The only exceptions are Job Lake on the northern boundary of the Bloodvein River watershed, Peisk Lake on the east end of Bloodvein River and Obukowin Lake, southwest of Carroll Lake, on the Gammon River. Water from these lakes flows into the park providing some potential for outside land uses to affect water flow and quality within the park (Fig. 15).

Water quality is excellent and suitable for drinking and swimming in all park lakes. These lakes demonstrate low buffering capacity and would be sensitive to acid precipitation, however, the park is removed from the influence of large sources of acid rain producing emissions.

Lake Productivity

Within Woodland Caribou Park, there is a pattern of decreasing lake productivity from north to south. Productivity is relatively high along the Bloodvein River and decreases within the Gammon River watershed and in the south sector (Fig. 16).

Approximately 40 percent of water surface area has been investigated through the lake survey program. The 52 surveyed lakes account for a surface area of 51,227 hectares and include most of the larger and heavily fished water bodies within the park.

The ability of a lake to produce fish and other aquatic organisms is related to the available nutrients and water depth.

"Four thousand anglers visit the park each summer generating in excess of 18,000 angler days"

Nutrients normally enter a lake in the form of dissolved solids, which is dependant on the land area surrounding each lake. Rain and snow-melt flow overland dissolving inorganic and organic substances from the soil, and eventually flow into lakes and are assimilated, as on land, by plant growth.

The productivity gradient within the park is closely correlated with the type and amount of glacial overburden. Glacial deposits of silt and clay are located in the northern portion of the park, along the Bloodvein River. As surface runoff passes through these deposits, greater concentrations of nutrients are available to these lakes. In contrast, the southern sectors, including the Gammon River, are comprised of bare bedrock with minimal surficial deposits and, as a result, nutrient levels are generally lower in this area.

The other important requirement for primary productivity is light penetration which is related to water clarity and depth. Lake depths within the Bloodvein River watershed average 5.8 meters while lakes along the Gammon River system average 9.9 meters in depth. Lakes in the northern portion of the park are shallower than lakes in the south, suggesting that the northern lakes have a larger percentage of their bottom area exposed to light penetration.

This pattern of nutrient availability combined with differing water depths explains the pattern of productivity seen throughout the park. Productivity values for lakes within Woodland Caribou Park are low when compared with other regional and provincial lakes. Average productivity for northwestern Ontario is 3.4 kg/ha/yr whereas the average value for park lakes is 2.3 kg/ha/yr (Table 8).

Table 8. Productivity of Ontario and Woodland Caribou Provincial Park Lakes.

	Productivity (kg/ha/yr)
Lac Seul	4.3
Lake of the Woods	4.2
Lake Erie	7.3
Northwestern Ontario average	3.4
Woodland Caribou Provincial Park	2.3

(productivity as estimated through the morphoedaphic index)

Figure 16

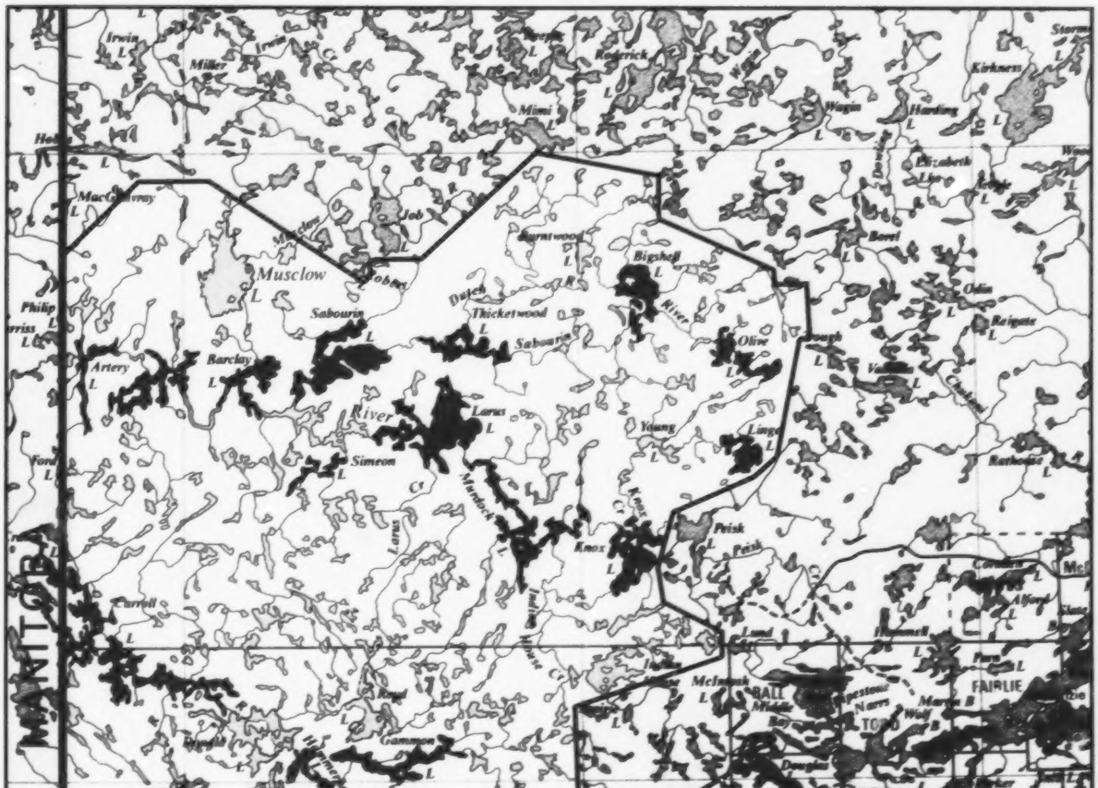
Lake Productivity

The aquatic productivity within the park is closely tied to the type and amount of soil cover and is generally low in comparison to other areas of Ontario.

■ > 2.5 kilograms/hectare/year

▨ 1.9–2.5 kilograms/hectare/year

□ < 1.9 kilograms/hectare/year


MANITOBA
Musclow L
Sabourin
Barclay L
Artery L
Larus L
Simeon L
River
Thicketwood
Dutch
Bigshell
Olive
Knox L
Murdock
Young
Prisk
Gammon
Haggart
Adventure L
Domain
Optic
Eagle L
Oiseau
Sydney
Lake
Lake
Lund
McIntosh
Douglas
FAIRLIE
Medicine Stone L
Deedee L
Kilburn
Leano
Sturgeon
Piccadilly Lake
Irwin L
Miller
Mimi L
Roderick
Wagin
Harding
Elizabeth
Kirkness
Job
Odin
Reigate
Carroll
Ford
Rostoul
Hansen
Wrist L
Welkin
Irregular
Paull L
Eden
Midrey
Chase
Conmee
Wyder
Sudbury
Caribou

1:600 000

0 10 20 km

North

Figure 17

Fish Communities

Park Lakes represent a diverse and largely intact aquatic resource providing excellent angling opportunities for walleye, northern pike and lake trout.

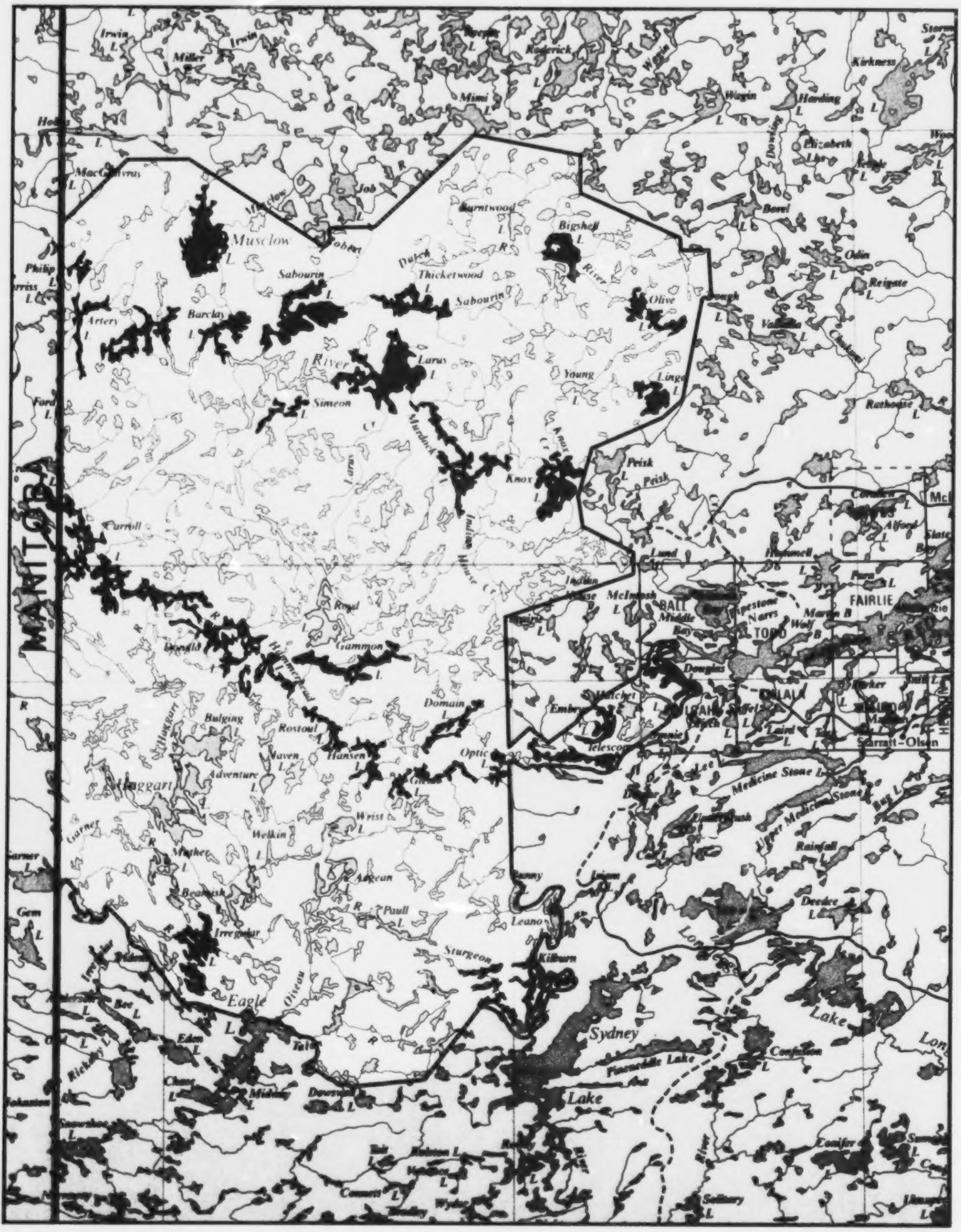
■ Walleye; northern pike

■ Lake trout; walleye; northern pike

□ Lake trout; northern pike

■ Northern pike; muskellunge

* Small mouth bass (Introduced)


MANITOBA
Irwin L.
Miller L.
Irwin R.
Roderick L.
Mimi L.
Wagin L.
Harding L.
Kirkness L.
Elizabeth Lks
Job L.
Musclow L.
Burntwood L.
Bigshell L.
Sabourin L.
Dutch R.
Thicketwood L.
Sabourin L.
River
Olive L.
Artery L.
Barclay L.
Larus L.
Young L.
Linge L.
Simeon L.
Knox L.
Peisk L.
Carroll L.
Indian House Cr.
McInnes L.
BALL
Middle Bay
Pipestone Narrs
TOBO
FAIRLIE
Royal L.
Gammon L.
Donald L.
Domain L.
Bulging L.
Rostoul L.
Haven L.
Hansen L.
Optic L.
Telescope
Medicine Stone L.
Upper Medicine Stone L.
Adventure L.
Haggart L.
Wrist L.
Welkin L.
Rainfall L.
Deedee L.
Paull L.
Leano L.
Sturgeon
Kilburn L.
Irregular L.
Eagle L.
Sydney Lake
Eden L.
Conifer L.
Starratt-Olsen
Odin L.
Reigate L.
Rathouse L.
Solitary L.
Robson L.

1:600 000

0 10 20 km

North

Fish Communities

The distribution of fish communities in Woodland Caribou Provincial Park demonstrates a pattern closely tied to lake productivity. Along the Bloodvein River, where productivity values are relatively high, walleye and northern pike communities dominate. Toward the south, where productivity begins to decrease, lake trout appear with the walleye and northern pike. In the south sector, where productivity is lowest, walleye disappear from the majority of lakes and are replaced by lake trout–northern pike communities (Fig. 17). In total, the park lakes represent a diverse and largely intact aquatic resource.

Lake trout–walleye–northern pike communities are common within the park. In these lakes, particularly along the Gammon River, shallow bays are available to provide walleye habitat and the deep basins provide habitat for lake trout. Walleye begin to disappear from lakes when shallow productive areas form only a small percentage of total lake area.

Headwater lake conditions are usually different than lakes further downstream. At the initial stages of water flow, nutrients entering a river system have not accumulated and as a result, fish communities in headwater lakes are often different than those downstream. Examples of this would be the presence of lake trout in Bigshell, Olive and Musclow Lakes within the Bloodvein River watershed and the absence of walleye from Upper Hatchet, Bunny and Leano Lakes within the Gammon and Sturgeon River watersheds.

Another fish species occurring naturally in Woodland Caribou Provincial Park is muskellunge. Irregular Lake contains a fish community of northern pike and muskellunge found in no other park lake. This represents one of the most northerly extents of muskellunge in Ontario.

Whitefish, cisco, sucker, burbot (ling) and yellow perch are the only other large fish species that occur naturally in park waters, and can be found in virtually every lake. The only exotic species occurs in Sabourin Lake where smallmouth bass were introduced in 1959. A small number of bass were released by local anglers and have subsequently survived to establish a reproducing population. After 25 years, bass are occasionally angled from Barclay and Sabourin Lakes, however they have not formed a significant portion of the fishery.

Harvest

Commercial Fishing

Commercial use of fisheries resources from Woodland Caribou Park historically included 11 of the largest water bodies in the park. Licences were granted during the 1950's as air transport developed to southern markets. Only three lakes were reported actively harvested for more than ten years, although more than half were licenced for a longer period (Table 9). Important fish species in the commercial harvest included walleye, northern pike, whitefish and lake trout.

Table 9. Commercial Fishing History of Woodland Caribou Provincial Park.

Lake	Years Licenced	Years Fished
Knox	1958–1968	7
Murdock	1958–1959	1
Larus	1950–1981	15
Sabourin	1955–1962	3
Musclow	1950–1984	29
Bigshell	1958–1959	1
Douglas	1960–1965	2
Carroll	1950–1972	13
Haggart	1955–1960	3
Bulging	1955–1960	3
Kilburn	1950–1977	8

Only two licences remained active after 1970 and these have since been retired. Commercial fishing remained on Larus Lake until 1977 before the licence was cancelled due to inactivity. Musclow Lake continued commercial production until the licence was acquired by the Ministry of Natural Resources in 1984. Currently there are no commercial fishing licences within Woodland Caribou Park.

Commercial Bait Fishing

There are 23 bait fishing areas, delineated by base map blocks of 241 square kilometers (100 square miles), within the park. Four bait fishermen hold licences covering from one to twelve blocks per licencee. The majority of bait fish are harvested from small pothole lakes using float planes during the open water season.

In 1984, a total of 52,500 dozen minnows were harvested from the park generating a gross value of $85,000.00. Minnow sales occur locally in Red Lake however most of the harvest is sold in the Vermilion Bay and Nestor Falls areas.

"Sport fishing is the mainstay of the tourist industry within the park"

"Fish consumed at shore lunches account for half of the total fish harvested from park lakes"

Angler Harvest

Woodland Caribou Park contains some of the finest walleye, northern pike and lake trout fishing in Ontario. The majority of anglers gain access through the lodges, outpost camps, private cottages and boat caches located throughout.

In an attempt to estimate the angling pressures and fish harvest for the park, the major user groups were canvassed. Guests of the tourist industry and larger private resorts were asked to fill out questionnaires on their fishing activity and to provide fish length information from their angling creel. Questionnaire returns were received from over one thousand anglers and fish length information was collected for some 5450 sport fish. The remaining users, including cottagers and commercial air carriers, were also contacted to complete the harvest estimates.

All totalled an estimated 4000 anglers visited the park throughout the summer of 1985. These anglers generated in excess of 18000 angler days and removed more than 55000 individual fish from lakes throughout the park.

The majority of anglers originated from the United States reflecting the tourist industry presence in the park. Local residents accounted for only a minor percentage of total use with most activity concentrated on a small number of lakes during the winter ice fishing season.

Tourist Facilities

Main base lodges and outpost camp operators within the park played host to some 2500 guests generating a total of 12,000 angler days. This represented 66 percent of the total estimated angler days in 1985.

Anglers staying at commercial camps accounted for 68 percent of the total sport fish harvest. This harvest was partitioned among walleye (73%), northern pike (24%) and lake trout (3%). All but two developed lakes contain walleye suggesting it as the "bread and butter" species maintaining the tourist industry. Visitation at camps on lakes without walleye was minimal.

Angler effort is not normally isolated to lakes where tourist development is located. Most operators encourage day trips to surrounding lakes in an attempt to limit harvest pressure in specific water bodies. In 1985, 41 percent of the people staying at commercial camps fished lakes other than where their camp was located. The two main base operations redistribute more than 65 percent of the angling effort originating from their base. Guests of Sabourin Lodge, for example, fished along the Bloodvein River from Larus to Artery Lakes.

Cottages and Private Resorts

The second highest sport fish harvest in the park is attributed to guests of the cottages and private resorts. In the 1985 season this group accounted for approximately 27 percent of the total park harvest estimate.

On average guests of these private developments appear to stay in the park for a longer time than any other sector of the angling population. During 1985, private developments accounted for approximately 20 percent of park visitors but represented 26 percent of the total park user days.

Commercial Boat Caches

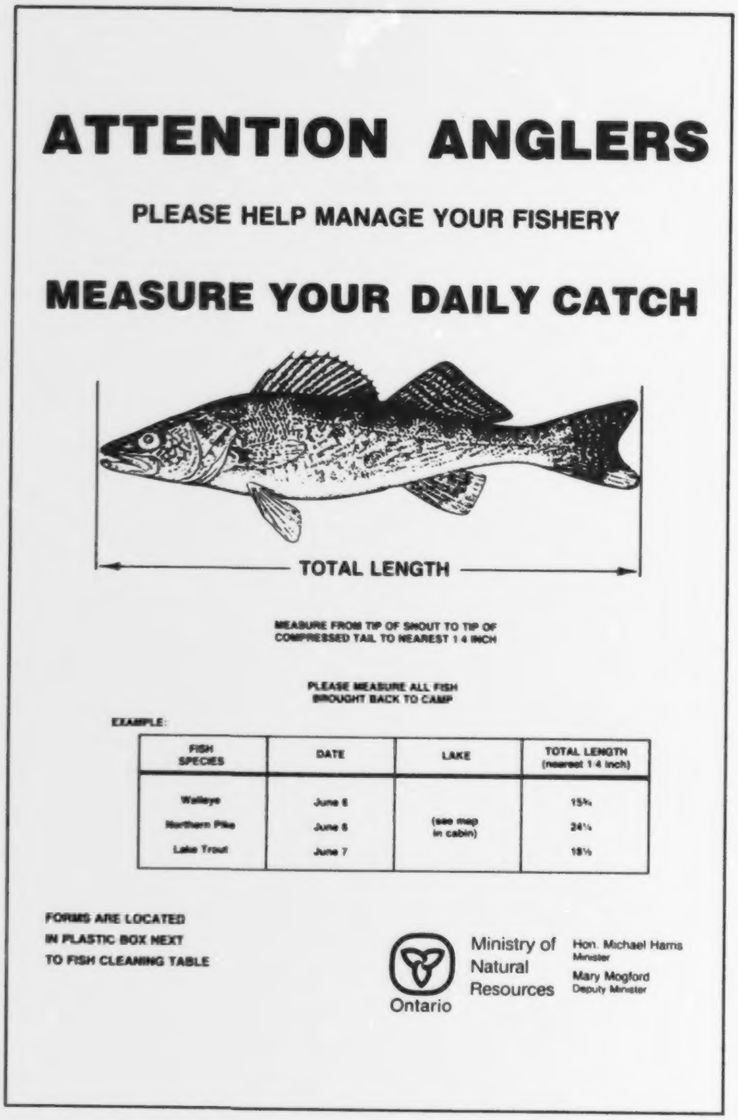
Boats cached within Woodland Caribou Provincial Park are distributed mainly along the Gammon River and south sector where the greatest number of lake trout lakes are located. Quantifying harvest by this user group is difficult because of the mobile and sporadic nature of boat cache use. Estimates indicate that the number of persons using commercial air service boat caches is similar to that of private cottages, however this use accounted for only six percent of the total park angler days. This suggests a much shorter trip duration which is born out by the fact that many boat caches are used exclusively on a fly-in day use basis. This shorter trip duration results in daily creel limits being removed more frequently, leading to higher rates of exploitation in some areas.

Distribution of Angler Harvest

The majority of angler harvest is located on the larger lake systems throughout the park. Harvest estimates are only of value when they are described in terms of the capability of individual lakes to sustain use. Comparisons of harvest levels with sport fish productivity on a lake by lake basis describes a pattern of fisheries exploitation throughout the park (Fig. 18).

In general, all lakes along the Gammon River system and most lakes in the south sector describe angler harvests which exceed theoretical yields. This is not surprising when one considers that this area contains the greatest development and is also the zone where lake productivity is lowest.

Along the Bloodvein River, harvest levels appear high in only four lakes. Although this river system provides as many angler days as the south sector, the lake productivity and potential sport fish yield is the highest in the park.



ATTENTION ANGLERS

PLEASE HELP MANAGE YOUR FISHERY

MEASURE YOUR DAILY CATCH

TOTAL LENGTH

MEASURE FROM TIP OF SNOUT TO TIP OF COMPRESSED TAIL TO NEAREST 1/4 INCH

PLEASE MEASURE ALL FISH BROUGHT BACK TO CAMP

EXAMPLE:

FISH SPECIES	DATE	LAKE	TOTAL LENGTH (nearest 1/4 inch)
Walleye	June 6	(see map in cabin)	15¾
Northern Pike	June 6		24¼
Lake Trout	June 7		18½

FORMS ARE LOCATED
IN PLASTIC BOX NEXT
TO FISH CLEANING TABLE

Ontario
Ministry of
Natural
Resources

Hon. Michael Harris
Minister

Mary Mogford
Deputy Minister

"Information collected by anglers is valuable in the assessment of sport fish stocks"

Figure 18

Angler Harvest as a Percentage of Sport Fish Productivity.

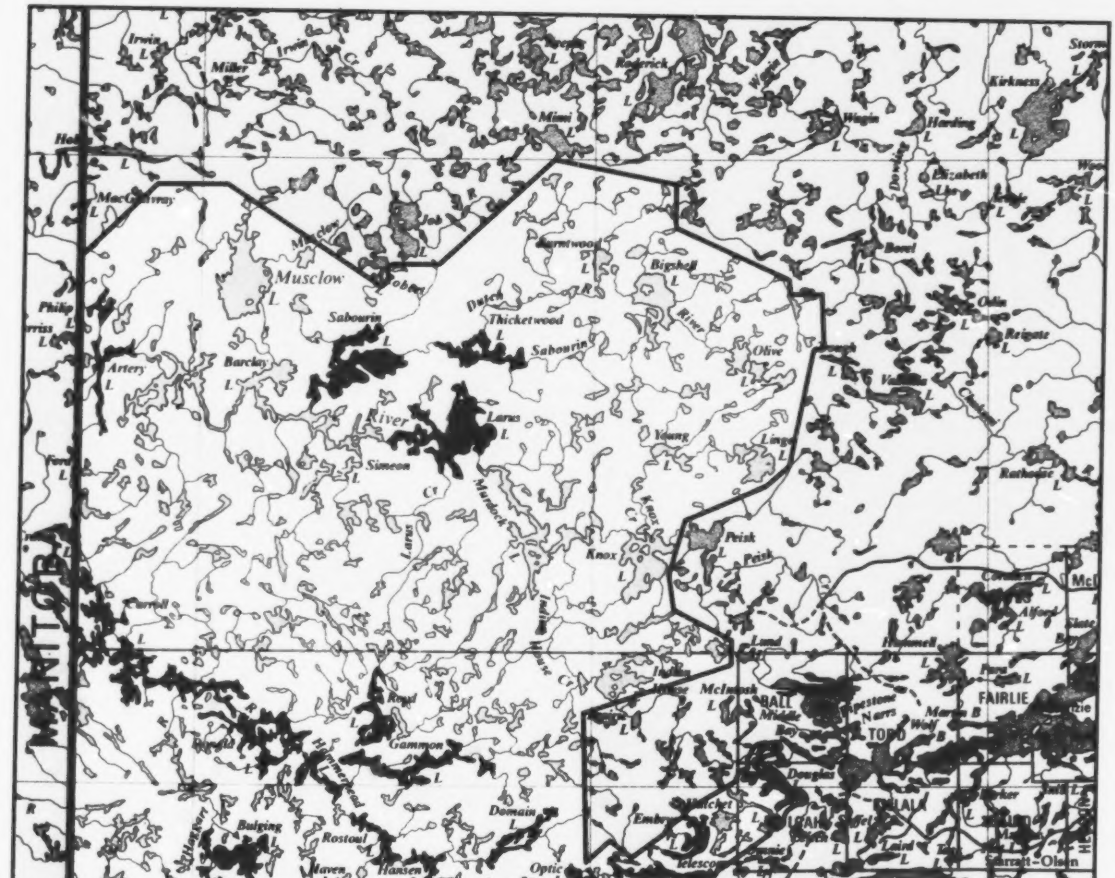
High angler use combined with low sport fish productivity results in high exploitation levels along the Gammon River and the south sector.

■ ≥ 100%

■ 51-99%

□ ≤ 50%

▨ Unknown


MANITOBA
Musclow L.
Sabourin L.
Thicketwood L.
Larus L.
River
Simeon L.
Barclay L.
Bigshell L.
Olive L.
Young L.
Knox L.
Peisk L.
Carroll L.
Gammon
Haggart
Bulging L.
Rostoul L.
Adventure L.
Haven L.
Hansen L.
Domain L.
Optic L.
Wrist L.
Welkin L.
Mather L.
Irregular L.
Leano L.
Kilburn L.
Sturgeon
Eagle L.
Sydney Lake
Longlegged Lake
Medicine Stone L.
Upper Medicine Stone L.
BALL
TORO
FAIRLIE
Douglas L.
Telesco
Madsen
Starratt-Olsen
Kirkness
Harding L.
Wagin L.
Roderick L.
Mimi L.
MacGillivray L.
Irvin L.
Miller L.
1:600 000
0
10
20 km
North

"Periodic monitoring of fisheries provides valuable trend-thru-time information"

Fisheries Management

A number of park lakes identified as experiencing heavy use still offer some of the best angling success in northwestern Ontario. The preceding section does little more than identify specific lakes where future fisheries management may be required to maintain or enhance a quality fishing experience. These lakes require additional information before management decisions can be made.

Lakes experiencing high use require further assessment to determine how the sport fish populations are responding to harvest stress. Because little historic information is available from park lakes, 1985 was chosen as the base year to monitor fish populations over time. Fish samples were removed from 18 heavily fished lakes throughout the park to quantify parameters that may be used as indicators of stressed populations. Some of these parameters include changes in abundance, age structure of both angler creels and the lake population, growth rates and age of the fish at maturity. The information from this index netting program, in conjunction with fish information collected through the angler creel surveys, should provide a solid data base for the recommendation of management strategies. In addition, this base information can be compared with future surveys to monitor the success of fisheries management efforts.

A questionnaire completed by over 1000 anglers in 1985 indicated a correlation between fishing satisfaction and the acceptability of fisheries management. Anglers reporting the poorest fishing appeared more willing to accept new harvest strategies.

"Catch and release" is fast becoming an accepted strategy for maintaining high quality fisheries"

Maintaining high quality fisheries can be attempted through the implementation of techniques such as size limits, creel limits, bait fish restrictions, fish sanctuaries and development and access controls. Continued co-operation of the tourist industry in fisheries assessment can also contribute to the education of anglers in fisheries management.

Cultural Resources

The cultural heritage resources of Woodland Caribou Provincial Park are both abundant and important, representing a major expression of the prehistoric hunter-gatherers of the boreal forest and Canadian Shield. The sheer density of undisturbed archaeological sites adds to the significance reflecting a high level of prehistoric occupation.

The fur trade period is well represented in the form of European trading posts and native habitation sites. These will be of considerable importance for cultural studies as reflected through trade goods. The Bloodvein River, especially, is a good representation of a major fur trade route.

Of particular significance are the numerous rock art (pictograph) sites within Woodland Caribou Park. One of the country's larger concentrations, a series of connected sites at Artery Lake, may be of international importance.

These human occupation sites will play a key role in unravelling the economic and ecologic relationships of the people who have occupied this land for the past 6000 years.

The Prehistoric Period

The Palaeo Indian Peoples

Evidence of these inhabitants of northwestern Ontario, who hunted big game on the tundra behind the retreating Wisconsin glaciers 9,000 years ago, is so far limited to the Thunder Bay, Rainy River and Lake of the Woods areas. Since it is known that they occupied the beaches of glacial Lake Agassiz in the Lake of the Woods/Rainy River Area, it is possible that some archaeological remains of these big game hunters will be found within Woodland Caribou Park.

"Prehistoric pictograph sites add an element of reverence and mystery to the park area"

These people inhabited a large part of the Great Plains and southern edge of the Canadian Shield, hunting mammoth until that species became extinct and then other large game such as caribou. Their diet was supplemented by fish, fowl, and edible plants.

The Archaic Peoples

These peoples replace or evolved from their Palaeo-Indian predecessors at about 3,000 B.C., and continued the tradition of big game hunting. These people engaged in subsistence activities and probably lived in small bands of extended family size. In Woodland Caribou Park they had strong connections to Archaic hunters on the Prairies and to other Archaic hunters across the Shield, engaging in limited trade with these groups. Native copper was traded from the Lake Superior area and Knife River and flint from North Dakota. The discovery of a number of Archaic camp sites on major waterways within the park suggests that these people used canoes, possibly dugouts.

The Laurel Peoples

By about 200 B.C., a combination of changing climate, improved subsistence resources, and strong influence from the mound-building Hopewell-Adena farming cultures in the Mississippi and Ohio valleys to the south, brought about another cultural change in Northwestern Ontario. These Laurel peoples were the first users of pottery in the area, and the large number and size of sites indicate increased population and suggest greater social complexity. The Laurel people built the spectacular burial mounds which still stand today along the Rainy River.

Campsites of the Laurel people are found in virtually all of the park area, some large enough to be classified as villages. Their artifacts of pottery, chipped and ground stone, cold-hammered native copper, and bone are extremely well made. Occasional evidence of well developed skills in wood working and basket making has been found. They continued the big game hunting tradition, but probably had semi-permanent villages in the vicinity of large sturgeon, whitefish and pickerel spawning grounds. There are also strong indications that they were harvesting the nutritious wild rice stands.

"Evidence of the Laurel People, the first users of pottery, can be found throughout the park"

The Blackduck and Selkirk Peoples

About A.D. 1000, another cultural change took place in the park area. The Laurel culture declined rapidly, and the Selkirk and Blackduck people (with pottery which is quite different in shape and decoration and of poorer quality than Laurel pottery) began to move into the area.

These people were also hunters, fishermen, and gatherers, and it appears from the archaeological evidence that they lived together in the same area, probably trading goods and intermarrying. They also built burial mounds but on a much smaller scale than the Laurel people. It is now becoming accepted among archaeologists that the Blackduck and Selkirk people were newcomers rather than descendants of the Laurel people.

Rock Art

Rock paintings (pictographs) are particularly important for Woodland Caribou Park, not just because of their abundance, but also for our eventual understanding of this prehistoric art form. Several pictographs are located throughout the park most notably along the Bloodvein, Gammon and Oiseau Rivers. One large site located at Artery Lake is of international significance.

Rock art sites are nearly always found on spectacular, vertical cliff faces at the water's edge, adding an element of reverence and mystery to the area. The paintings themselves often contain human and animal figures in a bright red pigment made from the mineral haemetite (red ochre) and possibly grease and oil from fish. Although their original purpose is unclear, many sites have a spiritual significance such as a shamen's (medicine man) special place of power. Some researchers are investigating the correlation of pictographs with astronomical phenomena such as star constellations.

These paintings on the walls of the Canadian Shield probably represent several time periods and may date as far back as the Archaic Period (3000 B.C.). As such, they represent an important visual record of the thoughts of the prehistoric artists who created them.

The European Influence

In the seventeenth century, trade goods such as glass beads, and metal knives, axes and pots, were traded into the area by native middlemen such as the Huron, and the aboriginal technology began to change. Metal gradually replaced local clays and chipped stone as raw materials for cooking utensils, knives, arrowheads and axes. Glass beads began to take the place of dyed porcupine quills for decorating clothing. Firearms became prized substitutes for bows and arrows. Records from this period combined with archaeological evidence suggests that the prehistoric Selkirk peoples were the ancestors of the modern Cree.

The Fur Trade History of the Bloodvein River

The parks history is best known for a brief period of intense fur trading competition centred on the Bloodvein River, between the late 18th and early 19th century. Although it was considered an undeveloped land by many historians, early prospectors and geologists stumbled across the remains of a vibrant and hotly contested fur trade, the details of which are alive with vivid detail concerning the people and events of the Bloodvein past. The Ojibway Indians who lived there were skilled hunters and trappers and the region produced an abundance of high quality furs. The Hudsons Bay Company (HBC) and the Northwest Company (NWC) used the Bloodvein as one of the many secondary trapping areas and routeways between the major routes of the Albany and English River systems that connected Hudson Bay and Lake Superior with Lake Winnipeg (Fig. 19).

The Early Days

Originally, the Ojibway Indians traded with the French in the 17th century making long trips from Lake Winnipeg to James Bay and the St. Lawrence River. When the British overtook New France and developed HBC posts, the French posts were abandoned and the Indians traded with the HBC. This was long distance trading as well, following 2 main routes to Lake Superior:

1. Grand Portage—Rainy Lake—Lake of the Woods—Winnipeg River—Lake Winnipeg
2. Lake Nipigon—Lac Seul—English River—Winnipeg River.

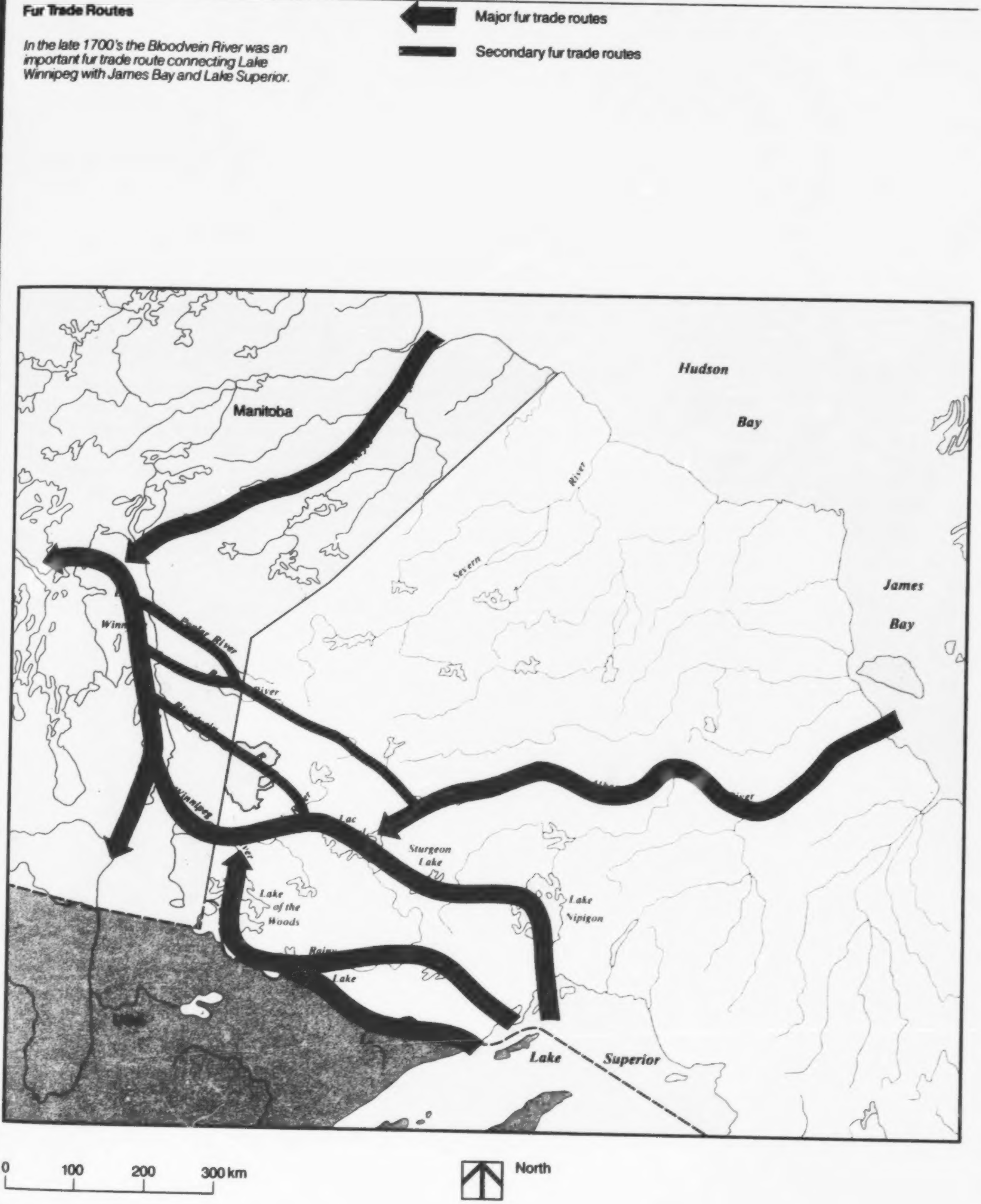
The second route opened up an area known as the "Little North" which included Red Lake, the Bloodvein River and Woodland Caribou Park. This was controlled first by an independent trader, Ezekiel Solomon, from 1760-1783. Solomon, with the largest complement of fur traders in the northwest fur trade, located numerous posts in the region, including Red Lake, which appears to have been the westernmost penetration at that time. The Bloodvein Indians, led by Metweash, were probably participating in the fur trade during Solomon's era.

Solomon's increasing stranglehold on the fur trade came to an abrupt end with a devastating small-pox epidemic that spread throughout the southern parts of the Little North. Solomon's trade sustained heavy losses including the Bloodvein/Red Lake Indians, and consequently he withdrew from the Little North in 1783.

Figure 19

Fur Trade Routes

In the late 1700's the Bloodvein River was an important fur trade route connecting Lake Winnipeg with James Bay and Lake Superior.


Major fur trade routes
Secondary fur trade routes
Manitoba
Hudson
Bay
James
Bay
Severn
River
Winn
Poplar River
River
Winnipeg
ver
Lac
Sturgeon
Lake
Lake
of the
Woods
Lake
Nipigon
Rainy
Lake
Lake
Superior
0
100
200
300 km
North

Duncan Cameron vs. the HBC (1784–1796)

A partnership of Gabriel Cotte and Duncan Cameron (who assumed Solomon's trading network), and the HBC, led by James Sutherland, soon took advantage of Solomon's withdrawal and built posts beside each other on Red Lake in 1790. They expanded their main trading routes to include the Albany River to James Bay, which was connected to Red Lake via Lac Seul/Chukuni River, and to a lesser extent the Trout River/Birch Lake/Bamaji Lake route.

The trading system employed by the HBC and Cameron involved extending credit to the Indians in the fall, in the form of trading goods, which the Indians repaid in the winter with furs. Most Indians were faithful to the fur companies and became attached to a specific post. Gift giving, an essential part of Indian culture, was used excessively by the companies to increase their share of the fur trade market. However, in many cases, the value of the gifts almost equalled that of the goods traded, resulting in low profitability.

The more experienced and knowledgeable Cameron, was out-competing the HBC at this time. Although their relationship was amicable, the competition in the Indian trade was fierce, producing 1440 beaver skins in one winter. The clerks of the trading companies were also given a premium on the fur returns to their posts. This proved disastrous for the fur trade since it encouraged rapacious harvesting of furs without regard to the long term consequences.

Cameron's traders were the first to push west along the Bloodvein River and, in 1791, developed a post at a place called Bad Lake. The HBC followed in 1792, but they had to pay their men a premium to entice them to travel to and settle at Bad Lake. Although the location is difficult to determine, some clues are available. It was said to be near the headwaters of the Bloodvein, 11 days from Red Lake with a loaded canoe, 70 portages from Lake Winnipeg and was followed by one lake of similar small size before crossing the height of land south to Red Lake. This could have been Knox Lake, but Murdock and Larus Lake have also been suggested.

Here again, Cameron's clerks were much more profitable than the HBC due to the latter's poor relationship with their men. Consequently, the HBC did not resettle the Bad Lake post in 1793/94, allowing Cameron and company to secure a much larger share of the fur trade.

During this time, moose, caribou and beaver flesh were traded mainly for liquor, while skins were exchanged for utilitarian items such as cloth, blankets and firearms.

In 1794/95, Magnus Birsay and the HBC operated a post at Red Lake. However, many independant Canadian traders were stationed at numerous posts in and around the Bloodvein area, and their stiff competition caused the HBC to abandon the Red Lake Post and move south to the English/ Winnipeg River area.

HBC, NWC and XY Co. Battles (1796–1805)

In 1796, Cotte and Cameron were absorbed by the increasingly powerful Northwest Company out of Montreal. In 1798, Sir Alexander McKenzie and a number of discontented Nor'Westers split from the NWC and formed the XY Co. Magnus Birsay and the HBC returned to Red Lake in 1799 to find the NWC trader building beside his post.

The period 1800–1805 was very critical in the development of the fur trade industry in the Bloodvein area. Both the HBC and NWC has posts together either on Red Lake or Bad Lake, and commonly operated year round. In addition the XY Co. was trading in the Red Lake–Bloodvein area. This intense three way competition which encouraged excessive exploitation of furs, moose and caribou, produced short run gains for the Indians, but proved disastrous in the long run as the ecological balance was destroyed.

By 1804/05, the number of traders in the Bloodvein area peaked, as 175 traders were in the eastern drainage basin of Lake Winnipeg. Fur returns peaked earlier in 1798/99, producing 19,500 beaver skins. This dropped drastically to 5000 in 1805/06 and to merely 138 in 1819/20. Moose and caribou populations were also decimated due to excessive hunting combined with a long cold winter, low rainfall and numerous large fires. In 1805, the XY Co. rejoined the NWC, increasing their advantage over the HBC.

Resource Depletion/Fur Trade Reorganization (1806–1821)

The larger NWC felt the impact of decreased furs more sharply than the HBC and therefore resorted to threats and violence to gain more furs. As a result, the HBC withdrew from the Red Lake quarter again in 1806 not to return for 10 years. Both the HBC and NWC reorganized and drastically reduced the number of posts and men, but the NWC still maintained a post at Red Lake and Bad Lake.

In 1810, the HBC split the jurisdiction of the Bloodvein and Red Lake areas. The Bloodvein furs traded north to York Factory and the Red Lake furs traded east to Fort Albany. This created considerable and lasting difficulties as well as new competition between the Berens River/York Factory and Red Lake/Fort Albany area traders.

When the HBC returned in 1816, they found a very depleted resource, insufficient moose and caribou for winter meat and Indian traders subsisting on fish and rabbits, plus wild rice, which they wouldn't sell.

The Bloodvein Indians

The Indians of the upper Bloodvein were generally mobile and tended to migrate westward during the early 19th century. Possibly originating from the Lake Nipigon region, they were called the Kingfisher clan, a name associated with the Ojibway nation. Their hunting ground centred around Bad Lake, but they also traded at Red Lake.

In 1819, a measles epidemic, possibly introduced by NWC men, swept through the upper Bloodvein region, reducing the Kingfisher clan from 130 to 57. Following the epidemic, the band appears to have moved north to Sasaginnigak Lake in Manitoba.

HBC Monopoly (1821-)

The union of the HBC and NWC in 1821 had far reaching effects on the fur trade and the Indians of the Red Lake/Bloodvein River region. The more efficient and better organized HBC dominated the more powerful NWC and therefore retained the HBC name.

The HBC immediately streamlined their operation again, by closing a number of posts including those in the Red Lake/Bloodvein area and dismissed a large number of employees. With a monopoly on the fur trade, the HBC could dictate the terms to the Indians who were now totally dependent on their posts.

With the closing of the Red Lake/Bloodvein area posts, the Bloodvein Indians had to travel north to the Berens River and south to Lake of the Woods to trade their furs. Also, they became increasingly dependent on single HBC posts such as Lac Seul, and their subsistence pattern of hunting large game deteriorated to a precarious living of fishing and trapping small fur bearing animals such as hare and muskrat.

The Indians suffered more setbacks following 1821 when the HBC introduced a number of conservation measures. They banned summer trapping, steel traps and the large amounts of liquor that were normally distributed to the Indians in the late 18th century.

The HBC also replaced the debt system with the ready barter system which involved the direct exchange of furs for goods. This caused more hardship as it was not consistently applied and most of the goods were of such poor quality that they barely lasted half a year.

In the mid 19th century, a number of epidemics plagued the Bloodvein Indians, including whooping cough, influenza and measles.

The Treaty and Railway Period 1871–1920

Treaty 3, signed at the Northwest Angle of Lake of the Woods, probably involved the Bloodvein Indians, however the geographical boundaries did not extend that far north. The Bloodvein band, totalling 77 Indians, was given a small reserve at the mouth of the Bloodvein River.

The completion of the C.P.R. across Northwestern Ontario in 1880, markedly increased the efficiency of the fur trade industry in that region. Goods, unloaded at Dinorwic and Dryden, were taken to fur trade posts by small steamer and freighter canoes.

Despite this modernization, the Bloodvein Indians lifestyle during the late 19th century changed little. Moose, caribou and furbearers made a resurgence and fishing was productive. The early 20th century brought missionaries, geologists, miners, loggers and government agents which dramatically altered the Bloodvein Indians lifestyle. Several extended family campsites and modern trading posts such as the one at Barclay Lake operated throughout the park at this time. Seasonal movements based upon natural rhythms were replaced by fixed reserves and government built houses. The intimate relationship between Indian and fur trader was replaced by government bureaucracy.

Recent History

The discovery of gold in the Red Lake area, first in 1897, then again in 1925 caused the gold rush of 1926 which was referred to as the second Klondike. Thousands of prospectors and geologists converged on the area, resulting in Red Lake having the busiest airport in the world in 1936.

One such prospector was Arthur Carlson, a Swede, who moved to Red Lake in 1929. Mr. Carlson built the first tourist camp in the park, located on Douglas Lake. Since that time the increased popularity of the park as a recreation area has resulted in the numerous tourist camps and private developments evident today.

Recreational Resources

Woodland Caribou Park offers a range of wilderness canoeing environments that are representative of the boreal forest. Woodland Caribou, the fifth largest provincial park in Ontario, provides 1600 kilometres of canoe routes, the same as Quetico, and is second only to the much larger Algonquin Park at 2560 km.

Two major historic river systems, the Gammon and the Bloodvein, dominate the park which is characterized by numerous irregularly shaped lakes. The extraordinary scenery of the park is created by the variety of jack pine bedrock shorelines, cliffs, cascading waterfalls and rapids, and rich spruce and poplar shorelines. The hot dry climate of this area further enhances the pleasure of outdoor recreation.

Although the overall character of the park is subtle, it offers a provincially significant variety of environments for the traveller to experience.

Navigability

One of the major assets of the park, from a canoeing standpoint, is the "Canaux et Lac" drainage pattern. Essentially, this means a bedrock controlled lake system joined by short quick drops containing falls or rapids (Fig. 20). Consequently, the ease of travel is very high with portages averaging 200–300 meters in length. The longest portage in the park is 1.5 km which is often the norm in other parks.

The Gammon River effectively divides the park into two distinct units referred to as the north and south sectors. Both sectors can be further subdivided into smaller units based on the character and concentration of the canoe routes. These units are as follows:

Southeast (Oiseau and Talon Rivers)
Southcentral (Haggart River)
Southwest (Wanipigow and Garner Rivers)
Gammon River
Central Sector (area between Gammon and Bloodvein Rivers)
Bloodvein River
Northeast (Sabourin River)

Southeast Sector

The southeast sector, drained mostly by the southerly flowing Oiseau, Sturgeon and Talon Rivers, provides a concentration of existing and potential canoe routes resembling the pattern of a spiders web. The heavily fractured bedrock provides almost effortless canoeing on a number of long, narrow lakes with short, easy portages. Most of the rapids that do exist are low and rocky and therefore not navigable.

Development for the south sector is limited to primitive campsites, portages on approximately half of the routes, and two small outposts, providing a very high quality wilderness experience.

Southcentral Sector

The northerly flowing Haggart River dominates this sector which is characterized by moderate sized, broad lakes which tend to mask the bedrock fracture pattern evident in the southeast sector. The numerous canoe routes which follow the NW-SE pattern provide direct access to the central and western portions of the Gammon River. Linkages between the routes are not as numerous as in the southeastern sector.

Travel is slightly more challenging due to the longer, more difficult portages and the higher wave danger. The major route through this section, which originates at Eagle Lake, and follows Irregular and Mather Lakes to the Haggart River, crosses 3 watersheds on its way to Carroll Lake and offers some whitewater opportunities in its northern reaches.

Southwest Sector

The southwest sector, headwaters of the westward flowing Garner and Wanipigow Rivers, offers only a few routes through a markedly different environment of flat, exposed bedrock and numerous wetlands. Few lakes and small creeks occupy this wilderness area where the ease of travel relies on higher water levels.

Gammon River

The Gammon River is characterized by a chain of moderate sized lakes separated by falls and cataracts. Crossing the entire width of the park, the Gammon River offers one of the two major corridor waterway routes. It passes through a number of different environments from rich coniferous forests in the east to steep bedrock-open jack pine shorelines in the west.

The short, well-trodden portages, and absence of fast water, make travel fairly easy. Some of the larger lakes in the system such as Carroll, Donald, Rostoul, Hansen and Telescope, could pose an impediment to travel in strong winds.

At Glenn Lake a number of opportunities occur to travel with relative ease on a number of alternate loop trips to the south sector. Fewer similar opportunities exist to the north.

The Gammon waterway itself is one of the most developed areas in the park with numerous outpost camps, private cottages, boat caches, well used portages and unorganized primitive campsites.

Central Sector

The Central Sector, between the Gammon and Bloodvein Rivers, contains the headwaters of the two major river systems. Travel through this area is difficult due to the predominance of small, shallow, meandering creeks and more lengthy headwater crossings. A few important routes exist to connect the Gammon and Bloodvein Rivers.

Figure 20

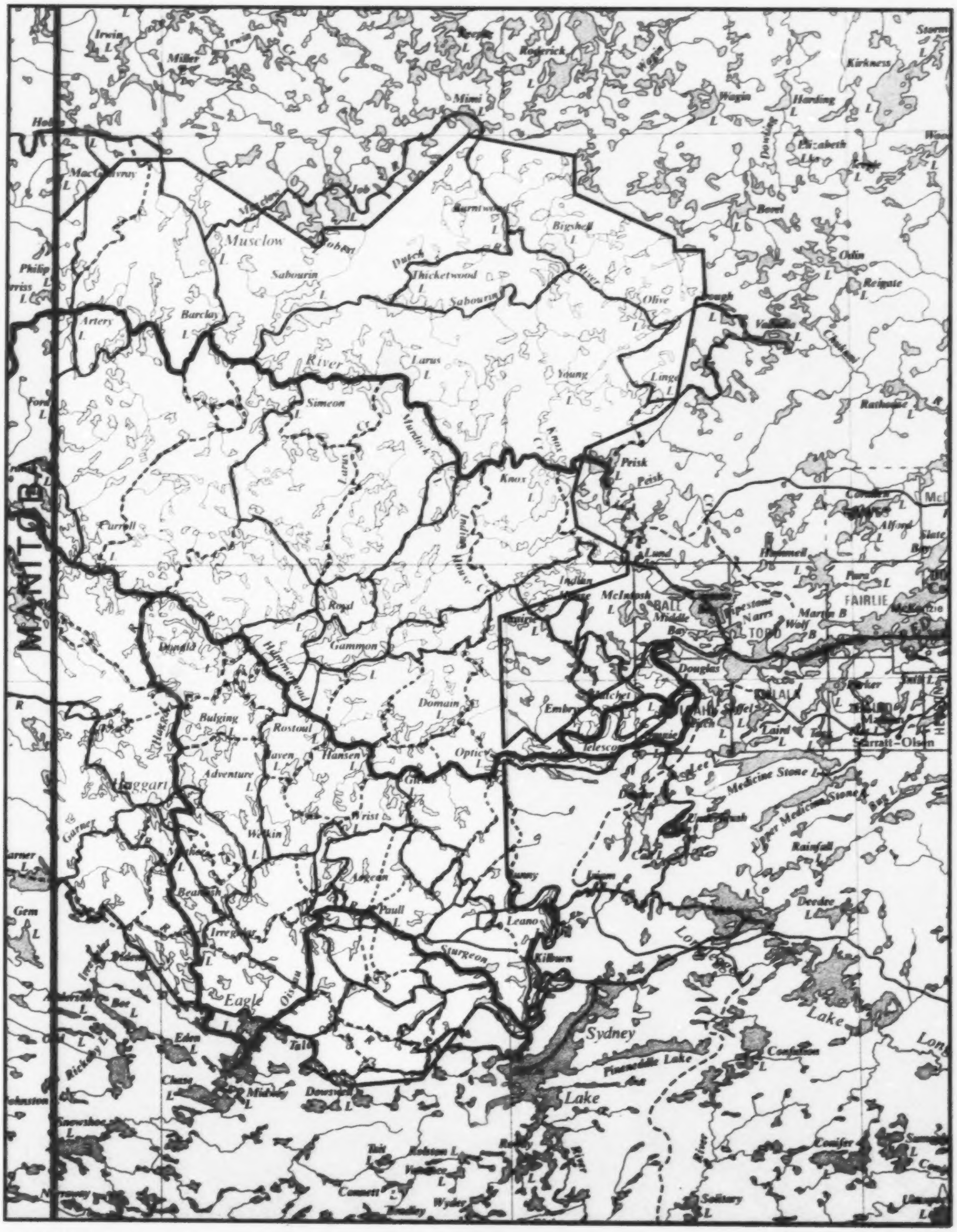
Canoe Routes

A majority of the park's 1600 km of canoe routes are located in the south sector.

Primary

Secondary

Potential


MANITOBA
Irwin L
Miller L
Irwin R
Roderick L
Mimi L
Wagin L
Kirkness L
Harding L
Elizabeth Lke
Dowling
MacGillivray L
Musclow L
Sabourin
Burntwood L
Bigshell L
Borel
Odin
Philip L
Thicketwood L
Sabourin
Olive L
Reignate L
Artery L
Barclay L
River
Larus L
Young L
Linge L
Ford L
Simeon
Murdock
Knox
Rathouse L
Knox L
Perisk
Currell
Indian House
Land
Hammell
Alfred
Slate Bay
Indian House
McIntosh L
BALL
Middle Bay
Pipestone
Narrs
TODD
Wolf
Martin B
FAIRLIE
McKenzie
Royd
Gammon
Dundas
Douglas
Domain L
Embry
Bulging
Rostoul
Howard
Haggart
Adventure
Raven L
Hansen L
Optic
Telescope
Laird L
Sarratt-Olsen
Lee
Medicine Stone L
Upper Medicine Stone L
Wrist
Walkin
Garner L
Rainfall
Aegean
Gem L
Beaumont
Paull L
Leano
Deedee L
Irregular
Sturgeon
Kilburn
Eagle
Olsen
Eden L
Sydney
Lake
Long
Confusion L
Pinenedde Lake
Chase
Midway
Dowswell L
Lake
Snowshoe L
River
Conifer
Tait
Rohtan L
Cannett
Wyder
Solitary L
Bradley
Larne L

1:600 000

0 10 20 km

North

"The "Canaux-et-Lacs" drainage pattern consists of elongated lakes joined by short, quick drops containing numerous rapids or falls"

These include Royd to Murdock Lake, Royd to Simeon Lake, Larus Creek to Larus Lake, and Carroll to Artery Lake via Ford Creek.

Development is limited to a few primitive campsites and portages. This factor, combined with the limited access and challenging routes, provides for a unique wilderness experience.

Bloodvein River

The Bloodvein is the largest and most diverse waterway in the park since it is composed of larger lakes, wider river channels, and a number of falls and cataracts. As it traverses the entire width of the park, it passes through a number of environments which are quite different than elsewhere in the park.

The deeper soils (silts, sands and clays) tend to cover the bedrock and produce a dense coniferous and mixed wood forest, particularly in the central and eastern sections. Rugged bedrock shorelines become more dominant towards the Barclay and Artery Lake area.

The river drops more quickly in the eastern section and portages, which are fairly short and easy, are more numerous. In the section west of Larus Lake, large distances can be travelled with few portages. The main impediment to travel on the Bloodvein River is the potential for high waves on the larger lakes.

The Bloodvein route is primarily linear and offers few opportunities for side trips. There are a number of outpost camps, cottages and boat caches particularly in the eastern section of the Bloodvein. The entire stretch from Larus to Artery Lake is used by guests of Sabourin Lake Lodge.

"Woodland Caribou Park has over 1600 km of high quality canoe routes"

Northeast Sector

The northeast sector, containing the Sabourin River, offers a very different canoeing experience for the park. This route, which flows from Olive to Sabourin Lake, provides a very diverse and interesting small river experience. Navigability ranges from difficult in the upper reaches to easy below Bigshell Lake. There are only a few short, well travelled portages and the current aids downstream travel.

Development is limited to two small outpost camps, a few boat caches and primitive campsites. Alternate routes within this sector include Bigshell Lake to Burntwood and Thicketwood Lakes or Mimi to Musclow Lake.

"The viewing potential of the park's south sector is enhanced by the more intimate enclosures which tend to magnify relief"

Recreation Features/ Aesthetics

Recreation features are natural and cultural features that would attract use or add to the users experience. These features include such things as waterfalls, beaches, cliffs, sport fisheries, pictographs and overall aesthetic appeal. For the park as a whole the most obvious features are the high number of aesthetic lakes and a very high quality sport fishery.

"Rock fall on the Haggart River"

The amount of rugged bedrock and scattered jack pine shorelines, bays, points and islands increases steadily to the west. The result is a general improvement in aesthetic values from east to west.

The south sector supports a number of recreation features including the highest concentration of cliffs and the very attractive steep bedrock and scattered jack pine shorelines in the park (Fig. 21). Although not as rugged as areas to the north, the intimate enclosures offered by the narrow lakes magnify the relief. The clear deep and cold lakes that are specific to this area and the Gammon River provide for excellent lake trout fishing. The numerous routes through the caribou habitat centred around Beamish to Bulging Lakes also increases the traveller's chances of spotting caribou.

Since the Gammon River is a major waterway, the falls and rapids are more numerous and spectacular, and archaeological sites and beaches are more common. However, despite the greater relief, the larger lakes decrease the visual impact and do not equal the contrasts offered in the south sector. The exception is Carroll Lake which is one of the most attractive areas in the park. Excellent opportunities exist to view moose in the burn at the east end of the river, while caribou may be observed around Royd Lake while travelling north to the Bloodvein.

The main features of the Bloodvein River include some of the best walleye fishing in northwestern Ontario, numerous archaeological sites, old Hudson Bay and Northwest Company fur trading posts, a number of large waterfalls, cataracts and rapids and a number of opportunities to view moose in the west end. The deeper sediments of this area are also responsible for the largest and highest quality beaches in the park.

In the northeast sector, the Sabourin River offers a small river experience with high vertical cliffs, clear lakes, excellent beaches on Bigshell Lake, rich marshland and the added attraction of possibly spotting a caribou. Aesthetic values are high throughout this trip from the bedrock, open jack pine shores of Olive Lake to the mixedwood forests of Bigshell and Sabourin Lakes.

Figure 21

Recreation Features

A variety of recreational features occur throughout the park including cliffs, beaches, rapids and falls, high quality fisheries and canoe routes and historical and archaeological sites.

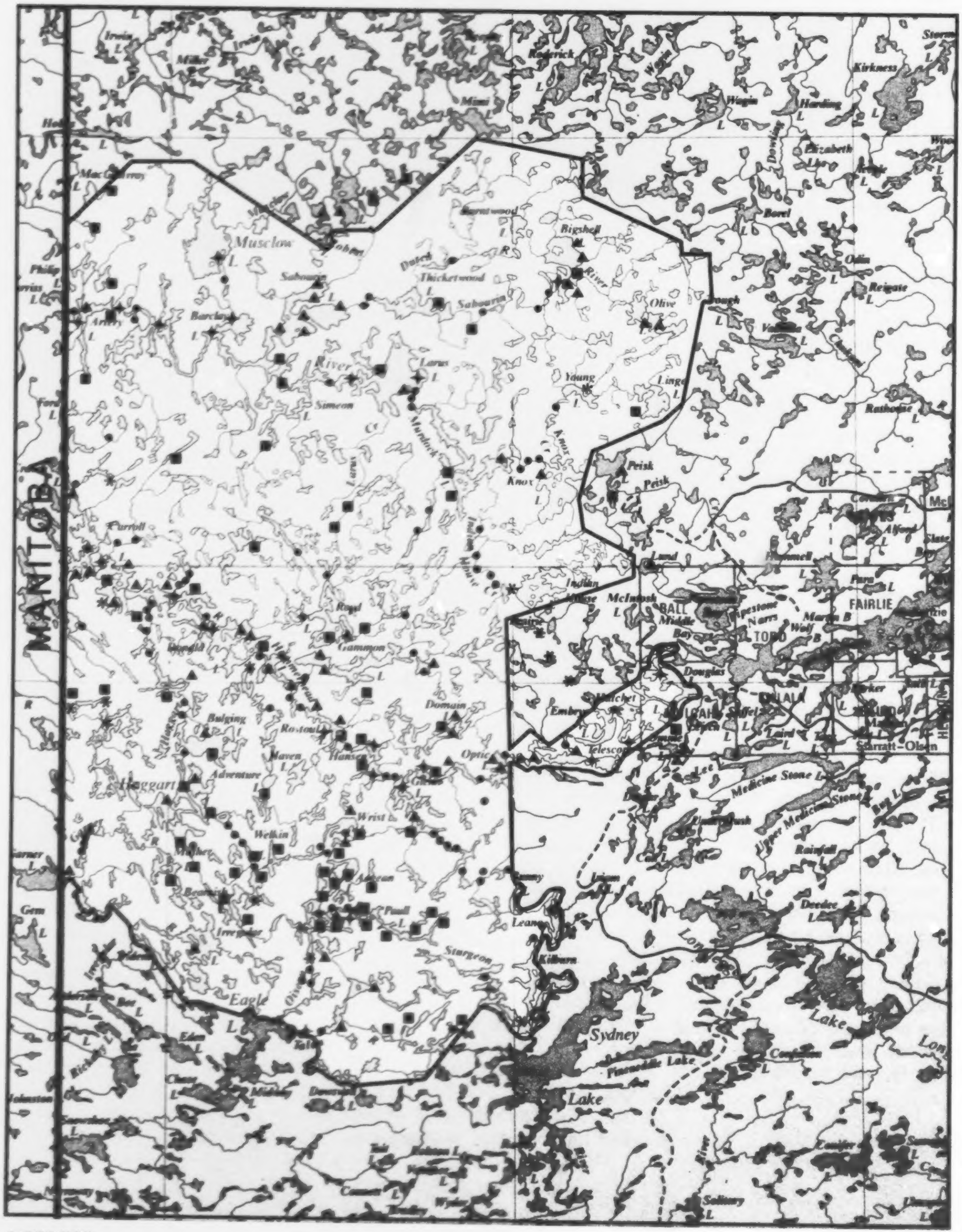
■ Cliffs

▲ Beaches

• Falls and rapids

✦ Historical and archaeological sites

✱ Natural physical features


MANITOBA
Musclow L.
Sabourin
Barclay
Dutch
Thickerwood
River
Larus
Simeon
Bigshell
Olive
Young
Linge
Knox
Peisk
Royal
Gammon
Domain
Rostoul
Bulging
Maven
Haggart
Adventure
Welkin
Wrist
Aegean
Paull
Sturgeon
Eagle
Sydney
Lake
Pinenoddle Lake
Telescope
Optic
Upper Medicine Stone
Lee Medicine Stone L.
BALL
TORO
FAIRLIE
Starratt-Olsen

1:600 000

0 10 20 km

North

"The south sector offers the highest carrying capacity in the park due to the predominance of bedrock"

Carrying Capacity

Carrying capacity is a measure of the ability of an area to withstand recreational use without deterioration. This is an important element in the determination of potential access points, and campsite areas and is based on a number of biophysical factors such as soil type, slope and vegetation.

Overall, the campsite and day-use carrying capacity of the park is similar to other boreal forest regions. The main limiting factor is the thin soils which are susceptible to erosion.

A pattern of increasing carrying capacity is evident from east to west through the park (Fig. 22). This is opposite to the ideal situation whereby the highest carrying capacity would be near potential access areas and user concentrations along the east and south boundaries of the park.

The south sector exhibits mostly high carrying capacity. The exception is around Sydney and Kilburn Lakes where the moderate rating reflects a small pocket of thin clay loams and clay sands. These soils grade into well drained shallow sands to the north and west which, combined with the large number of bare bedrock points, produce a high carrying capacity.

The Gammon River (central section) grades from low carrying capacity in the east to high in the west. Thin, moist till deposits of silt combined with few good camping opportunities from Douglas to Optic Lake limit the carrying capacity of that area to low. The Optic to Glenn Lake section is severely limited by steep bedrock shorelines while Hansen and Rostoul Lakes offer a few potential campsites on shallow sands with a jack pine overstory producing a moderate carrying capacity. The Donald Lake area is an anomaly due to a small pocket of sensitive lacustrine clays. Clays are easily eroded and compacted and despite the large number of potential sites, the Donald Lake area supports only a moderately low carrying capacity. Carroll Lake, on the other hand, has the highest capacity of any lake in the park. A very high number of sites occur on well drained shallow sands and sandy loams with a jack pine and poplar overstory.

"Sand beaches, common in the north section, also provide high carrying capacity"

The same pattern appears on the Bloodvein River as on the Gammon River but for different reasons. Deeper lacustrine clays and steep dense shorelines dominate Peisk and Knox Lake resulting in the lowest carrying capacity in the park. This improves to moderate from Murdock to Larus Lake due to a much larger number of sites on shallow silty sands and bare bedrock.

Figure 22

Site Carrying Capacity

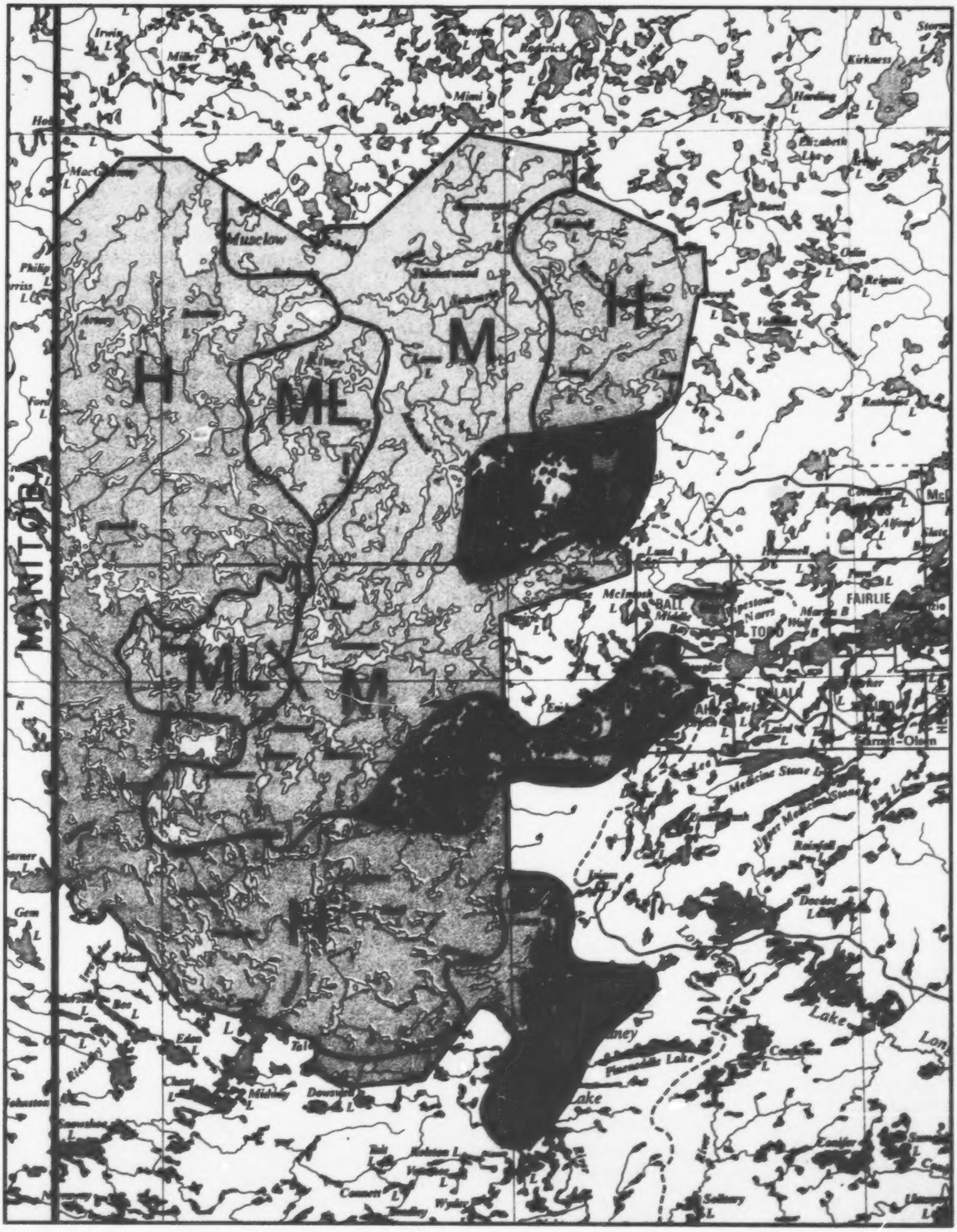
Carrying capacity, based on soil type, slope and vegetation, increases from east to west within the park.

H High

M Moderate

ML Moderately Low

■ Low


H
M
ML
H
ML
M
H
MANITOBA
Musclow
Irwin L.
Miller L.
Mimi L.
Kirkness L.
Harding L.
Elizabeth Lake
Reigate L.
Odin L.
Rathouse L.
McIntosh L.
BALL
Middle Bay
FAIRLIE
TORO
Medicine Stone L.
Upper Medicine Stone L.
Rainfall L.
Dogtooth L.
Lake
Pineneedle Lake
Eden L.
Chase L.
Mickley L.
Dowswell L.
Gem L.
Garner L.
Johnston L.
Philip L.
Ford L.
Muskeg L.
Richey
Coathorn L.
Lake
Solitary L.

1:600 000

0 10 20 km

North

The Simeon Lake area exhibits a moderately low carrying capacity resulting from a higher percentage of shallow, wet clay sites. Conversely, the area immediately to the west, Sabourin and Barclay Lakes, have a very high carrying capacity. Sabourin Lake supports a high number of deep, well drained sand beach sites, while Barclay offers a number of well drained sandy and bedrock jack pine sites. Artery and Mary's Lake also have a large number of sites, but they vary between bare bedrock and shallow well drained sand.

The northeast sector, including the Sabourin River from Olive to Sabourin Lake, ranges from high to moderate carrying capacity. Olive Lake supports a very large number of potential sites on thin sand and bare bedrock with jack pine while Bigshell Lake offers a number of deep, well drained sand beach jack pine and poplar sites. This high rating drops to moderate on Thicketwood due to the silty sands and fewer number of sites.

The park presently receives minimum back-country use and the majority of the sites and portages are in excellent condition. The only evidence of site deterioration occurs along the sensitive areas of the Gammon and Bloodvein routes where portages and day use areas are used frequently.

Access and Dispersal

To assist in the evaluation of potential entry points, a basic dispersal model was developed. This model was used to determine how far canoeists could travel on a daily basis, and also which entry points would most quickly disperse travellers to different routes with minimum crowding.

Two potential access points have been identified in the south sector (Fig. 23). Sydney and Eagle Lake would provide the best and most efficient dispersal in the park with ten and seven routes respectively. There are also a number of opportunities for smaller loop trips within this sector, many of which can be travelled in four days. From these points an eight day canoe trip could take a party into the heart of the park intersecting with the Gammon River at a number of points.

Sydney Lake offers immediate dispersal of travellers on several different routes with a high degree of navigability. This would effectively minimize the perceived level of crowding. Parties starting from Eagle Lake would have to travel slightly further on a few main and slightly more difficult routes to affect a similar degree of dispersal, consequently, the possibility of crowding could be slightly higher. The excellent dispersal from Sydney Lake could provide access to not only one of the most aesthetic areas of the park, but also to an area that should be capable of supporting the use with minimum site deterioration, thus providing a high quality back-country wilderness experience.

In comparison, the few routes into the park from Red Lake (Douglas-Telescope area) provide limited opportunities for dispersal. The linear nature of this corridor provides few alternate routes until approximately the third day when Glenn Lake is reached. This limitation increases the chance of encountering parties returning on the same route, effectively doubling the number of users and increasing crowding. This, combined with the generally low carrying capacity and low rating for recreation features and aesthetics, reduces the desirability of this corridor as a major access area. The Gammon River is better suited to extended trips where individuals can seek out alternate loop trips to the south sector or explore the park in its entirety by joining the Bloodvein, Haggart or Oiseau Rivers.

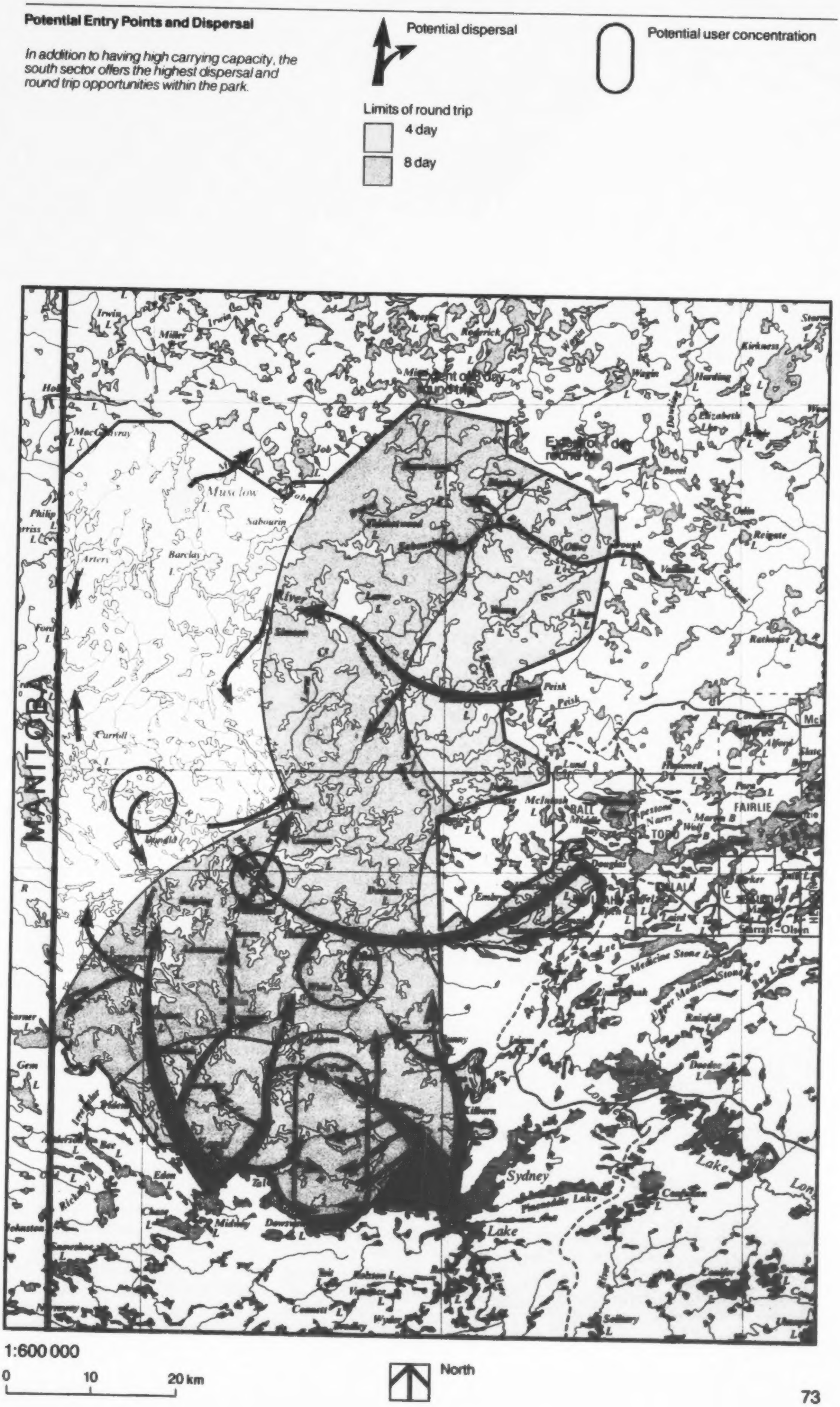
Dispersal from Peisk Lake, at the headwaters of the Bloodvein River is also restricted due to the lack of alternate and short loop trips. Although crowding could occur, it would not be as serious as in the Douglas Lake area since no portages would be encountered until the far side of Knox Lake. The relatively large lakes would visually absorb many users. The low carrying capacity and low recreation features and aesthetic rating in this section of the Bloodvein, reduces its desirability for short trips. However, as with the Gammon River, the Bloodvein is suited to more extended loop trips.

In the northeast sector, the Sabourin River (Olive to Sabourin) suffers from very limited dispersal in the first few days, but supports a number of recreation features, high aesthetic values and a high carrying capacity. Although the larger lakes along this route could support a moderately high level of use, the small river environment could cause bunching of parties at portages, detracting from the high quality wilderness experience that this area could offer. This reduces the desirability of the Sabourin River as a major access point.

Figure 23

Potential Entry Points and Dispersal

In addition to having high carrying capacity, the south sector offers the highest dispersal and round trip opportunities within the park.



Potential dispersal
Potential user concentration
Limits of round trip
4 day
8 day
Extent of 8 day round trip
Extent of 4 day round trip
MANITOBA
Muscle L.
Sabourin
Barclay L.
Artery
River
Carroll
Peisk
Odin
Reigate
Rathouse
Harding
Kirkness
Wagin
Roderick
FAIRLIE
BALL
TODD
Medicine Stone L.
Upper Medicine Stone L.
Rainfall
Sydney
Lake
Pinenoddle Lake
Midway L.
Eden
Gem L.
Long Lake
Solitary L.
Coulter
1:600 000
0
10
20 km
North

Market Analysis

Woodland Caribou Provincial Park is in the unique position of catering to a mixed tourism market. Currently there is a substantial accommodation based industry within the park. Additional visitation in the form of the traditional park users (canoeists/campers) is expected to increase by virtue of the area's wilderness park designation. This section provides a description of these two markets and examines market trends. Descriptions of the backcountry recreation market are based largely on available data for Quetico Park and the Boundary Waters Canoe Area (BWCA) in northern Minnesota.

Market Description

Park Visitation

In recent years the majority of use within Woodland Caribou Provincial Park has been associated with the private and commercial developments and boat caches. In 1985 the commercial tourist camps (including Manitoba camps) accounted for 66 percent of the total estimated 18000 user days within the park. The cottages and boat caches accounted for 26 and 6 percent of visitor days respectively.

The current use by campers and canoeists is unknown but is probably less than 200 visitors per year. Once marketed and operational, Woodland Caribou Park can be expected to capture an increased share of the traditional backcountry recreation market, however one can only speculate on an upper limit. This trend is evident in the significant increase in visitor inquiries since the park was created in 1983. As a reference point Quetico Park near Atikokan achieves an annual visitation of approximately 18000 campers (117,000 camper nights).

Temporal Distribution

Sixty percent of lodge and outpost camp guests visit Woodland Caribou Park in the first six weeks of the fishing season (May–June), 34 percent visit in July–August with the remaining six percent in September–October. In contrast only 40 percent of canoeists visit Quetico in May–June with 60 percent preferring a July–August trip. This temporal separation can be helpful in reducing user conflicts.

Party Size, Composition and Length of Stay

In addition to being almost all male the accommodation based parties within the park are largely non-family members. Average party size is six and the average length of stay is 4.6 days.

The Quetico canoeing market contains a large proportion of family groupings (± 40%). Party sizes are generally smaller (4–5) and trip lengths tend to be longer. For Quetico visitors the average length of stay is 6.5 days.

Market Area

Red Lake tourist operators exhibit a peculiar affinity to the Chicago market with one out of three anglers originating from the Illinois–Indiana area (Table 10).

Table 10. Angler Origins in the Red Lake Area

Origin	%	
Illinois	25	82%
Iowa	20	
Minnesota	16	
Wisconsin	14	
Indiana	7	
Other States	18	

The canoeing market area as described for the Quetico/BWCA area is somewhat more diverse (Table 11).

Table 11. Visitor Origins for Quetico Provincial Park

Origin	Percent of Visitors	
Minnesota	20	59%
Illinois	19	
Wisconsin	12	
Indiana	5	
Ohio	3	
Other States	29	
Total USA	88	
Canada	10	
Other Countries	2	

It is interesting to note that the top five states for visitors staying at tourist camps account for a full 82 percent of the market, whereas the top five states in the canoeing market account for only 59 percent of visitors. Another indication of the diversity of the canoeing market is the percentage of visitors from Canada and other countries. This element is not even measurable in the accommodation based market. The market area suggests the absence of the rural and farm element in the canoeing market as evidenced by the absence of states such as Iowa in the Quetico data. Iowa was number two in the accommodation based market. The absence of the rural community in the canoeing market is confirmed by many canoe outfitters in the Quetico/BWCA area.

Attraction to Area and Visitor Satisfaction

The major attraction for both the accommodation based and the canoeing markets is the quality of fishing. This is followed closely by a sense of wilderness experience.

Overall satisfaction of both the accommodation and canoeing markets is very high. This satisfaction level is reflected in high return visitation rates of 90 percent for lodges and outposts and 71 percent for Quetico visitors.

Marketing
The effectiveness of marketing techniques is similar for both markets. Eighty-two to 85 percent of all visitors cite previous visits or word of mouth as the main reason for their trip. Fifteen to 18 percent responded to other marketing techniques, primarily sport shows, brochures, magazine articles and advertising.

For first time visitors word of mouth remained the loading reason for visiting the area.

Party Expenditures
Expenditures on lodge and outpost camp packages range from 60 to 250 dollars per person per day depending on the quality of facilities and services. Based on visitation in recent years, it is estimated that the two main base lodges and 15 outpost camps within Woodland Caribou Park generate direct revenues of some 1.5 million dollars per year. This represents an average expenditure of 670 dollars per guest. These figures do not include expenditures by cottagers or fly-in fishermen using commercial boat caches.

Expenditure estimates for the backcountry recreation (canoeing) market can be made from available data for Quetico and the BWCA. Party expenditures on outfitting services for Quetico and the BWCA average 350 dollars with an estimated 20 percent of interior visitors utilizing the services of commercial outfitters. By applying these figures to the annual visitation, one can estimate gross revenues of 250,000 dollars for Quetico and 2.38 million dollars for the BWCA outfitters. This represents an average expenditure of 13 dollars per outfitted canoeist per day.

"Lodge guests and canoeists both cite quality of fishing and a sense of wilderness as the main reasons for visiting Northwestern Ontario"

"The tourist industry can provide access to wilderness"

This low daily expenditure, combined with the capability of the canoeist to be self-outfitted, suggest that the outfitting business depends on volume sales. In order for Ely outfitters to achieve annual revenues of over two million dollars, the BWCA has to maintain a visitation of over one million visitor days per year.

Market Trends

In recent years there have been a number of studies done on outdoor recreation participation and recreation trends. These studies in combination with sources such as angling licence sales and park visitation statistics describe some consistent projections or market trends for the non-resident angling and backcountry recreation markets.

Trends in Non Resident Angling

Angling licence sales, provincial angler surveys and a number of Ontario and U.S. recreation studies all project a moderate increase in non-resident angling participation. The rate of increase ranges between .8 percent and 1.9 percent per annum. This increased demand for quality sport fishing opportunities provides a positive outlook and some challenges for the tourist industry and fisheries managers alike.

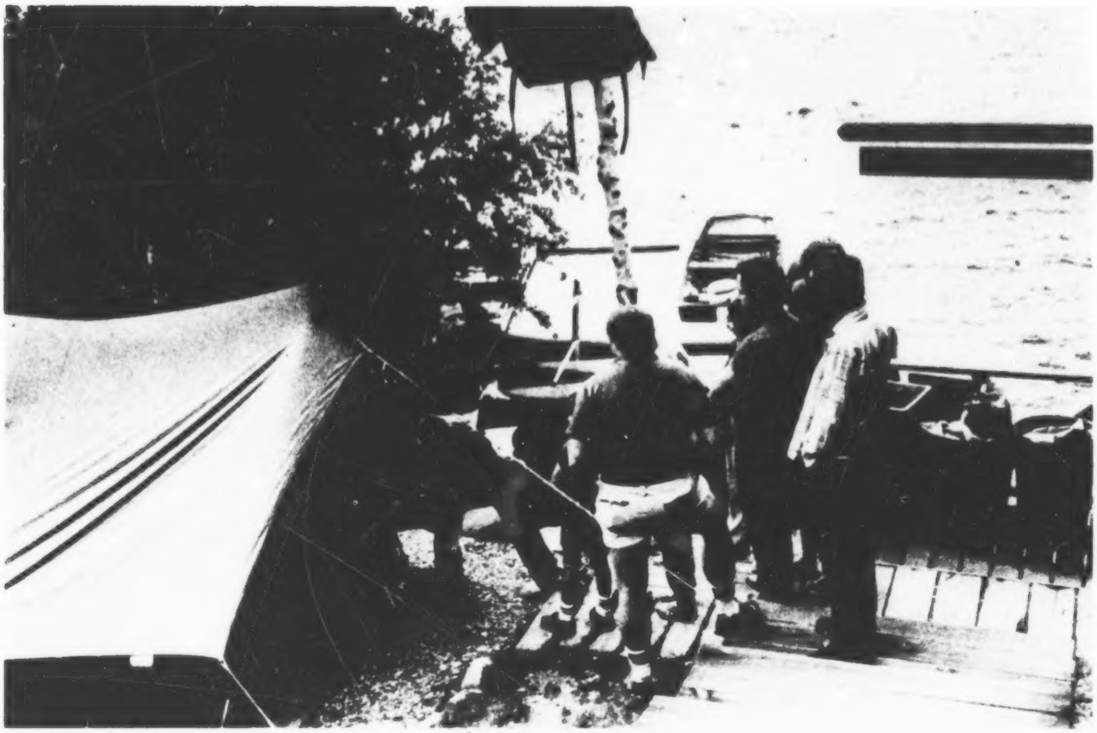
Trends in Non-Resident Backcountry Recreation

The best indication of trends in backcountry recreation (canoeing) for the midwestern U.S. is the visitation in Quetico and the Boundary Waters Canoe Area (BWCA) in northern Minnesota. Over the past five to seven years both Quetico and the BWCA have witnessed a significant decline in interior visitation ranging between minus three percent (Quetico) to minus five percent (BWCA) per year. This decline is not believed to be related to changes in park management (e.g. interior quotas) and has persisted despite recent upturns in the overall economy and increased marketing efforts.

This decline is recognized by both Ontario and U.S. based canoe outfitters as a major marketing challenge to their industry. Some have been able to maintain their business in a no-growth position in the face of the decline while others cite significant losses in revenue.

General U.S. Visitation and Socio-Demographic Factors

The midwestern United States will continue to be a major market area for Northwestern Ontario. The economic recovery, strong U.S. dollar and overall political climate should contribute to an increase in visitation at least in the short term.



"Canoe outfitting can contribute to the diversification of the tourism industry in the region"

Population projections indicate a lowering in population growth to 0.6 percent from the 1.2 percent experienced throughout the 1970's. The mini-echo baby boom will contribute to the demand for family vacation opportunities. The most significant demographic factor will be the drastic shift in the age profile. The median age of the U.S. population will increase dramatically from 30 in 1980 to 36.3 in the year 2000. By 2025 the median age will have increased 33 percent to age 40. This changing age profile is believed to be a key factor in the decline in backcountry recreation participation.

There will be more competition and specialization in recreational activities and a greater demand for quality experiences. Time available for leisure persuits will increase and there will be greater emphasis in meeting recreational needs through the private sector as government restraints continue. Recreation will continue to receive low priority funding unless a positive economic and tourism benefit can be realized.

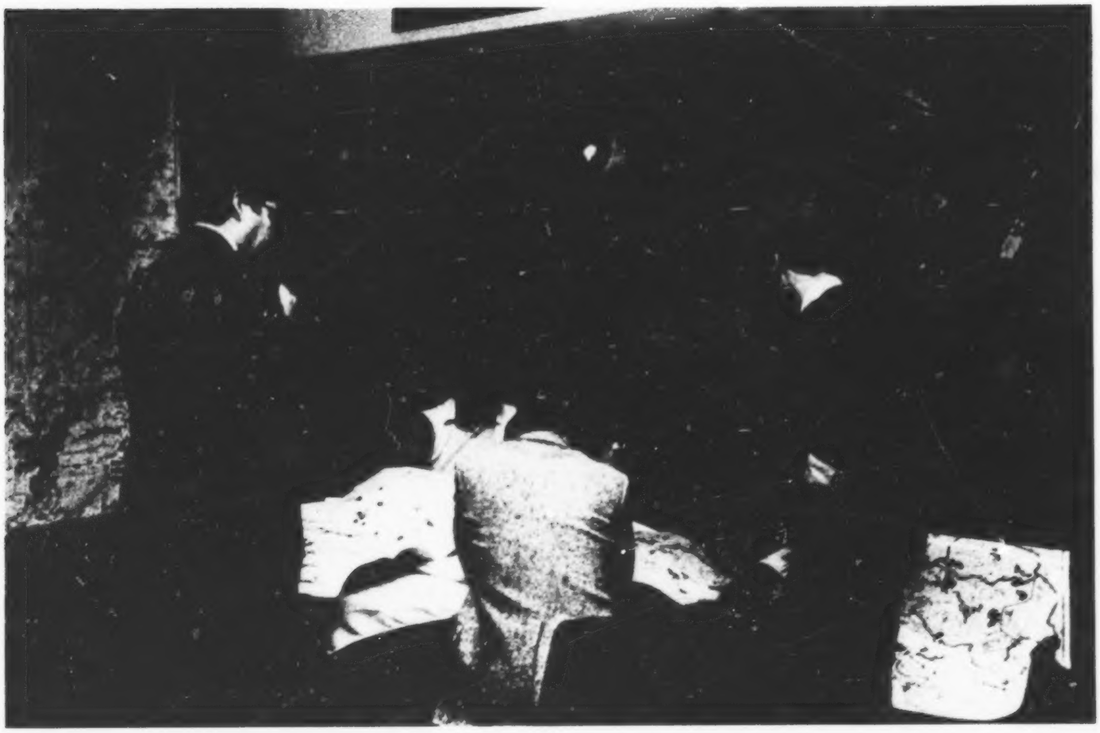
Implications for Park Management

The implications of this market information in the planning and management of Woodland Caribou Provincial Park are numerous.

In terms of visitation it would appear that any accommodation based services offering quality sport fishing opportunities should continue to enjoy market growth. The combination of geography and declining backcountry recreation participation suggests that it will be a number of years before Woodland Caribou will experience the level of visitation seen in Quetico. The success in attracting this market will depend on the quality and uniqueness of the experience being offered and the effectiveness of attracting new markets.

Woodland Caribou Park may be in the unique position of offering a wide range of wilderness recreation opportunities which have broad market appeal and are not available elsewhere in the region. Ideas ranging from uncrowded wilderness canoe tripping to high-quality wilderness lodge services with hut to hut backcountry travel have been suggested and will be examined as options in the management plan.

Planning Considerations



Woodland Caribou Provincial Park represents a significant contribution to the Ontario Provincial Parks System. The preceding chapters of this Background Information Document have described a unique and largely intact wilderness landscape of Ontario. They have chronicled provincially and nationally significant resources from the lesser known prairie boreal flora to the more obvious features such as the woodland caribou population, world class fishery, high quality canoe routes and prehistoric pictograph sites. The Park Management Plan will signal the beginning of the protection and management of these valuable elements of natural and cultural heritage.

Park Classification

The Ontario Provincial Parks Policy establishes a framework for a parks system in Ontario which represents the natural, cultural, and recreational features of the province in six classes of Provincial Parks.

These six classifications include Wilderness, Nature Reserve, Historical, Natural Environment, Waterway and Recreation Parks. Woodland Caribou is classified as a Wilderness Park. The concept of park classification recognizes that a well balanced park system provides a wide variety of experiences in a number of differing landscapes and ensures the maintenance of diversity within the parks system, from strictly protected natural areas to highly developed recreation facilities. Consequently, no individual park can be all things to all people.

Definition of Wilderness Parks

The Provincial Parks Policy defines Wilderness Parks as:

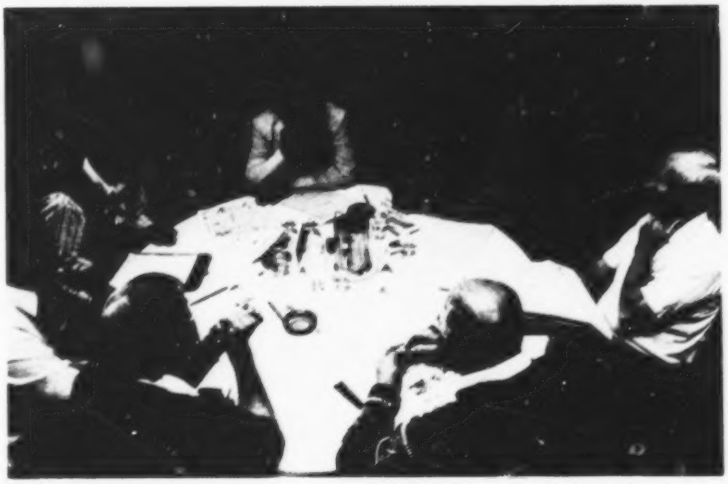
> "Substantial areas where the forces of nature are permitted to function freely and where visitors travel by non-mechanized means and experience expansive solitude, challenge, and personal integration with nature."

Provincial Park Objectives

The Park Policy also describes four objectives of the provincial parks system.

1. Protection Objective	To protect provincially significant elements of the natural and cultural landscape of Ontario.
2. Recreation Objective	To provide Provincial Park outdoor recreation opportunities ranging from high-intensity day use to low-intensity wilderness experiences.
3. Heritage Appreciation Objective	To provide opportunities for exploration and appreciation of the outdoor natural and cultural heritage of Ontario.
4. Tourism Objective	To provide Ontario's residents and out-of-province visitors with opportunities to discover and experience the distinctive regions of the Province.

Wilderness Parks contribute principally to the achievement of the protection, recreation and heritage appreciation objectives.



"User groups work together to reach concensus on cooperative park management"

Land Use Guidelines

When Woodland Caribou Park was created in 1983, a number of decisions were made relative to uses that would be permitted to continue within the park. These uses include tourism, hunting, trapping, commercial fishing, wild rice harvesting and mineral exploration. In addition, a commitment was made by the Minister to explore ways of increasing tourism benefits associated with the park. The land-use guidelines announcement of June 1983 also reflected the fact that the Ontario Provincial Parks Planning and Management Policies, known as the "blue book", should continue to serve, in its present form, as a guideline for the management of individual parks. This direction was considered essential to the integrity of the provincial park system as a whole.

A Concept for Woodland Caribou Provincial Park

Woodland Caribou Park must be planned as a wilderness park. Uses that contribute to the achievement of the wilderness park objectives established in the blue book will be encouraged. Other uses will be permitted to the extent that they do not jeopardize the integrity of the values for which the park was created. It is this emphasis on the protection, recreation and heritage appreciation objectives that must be carried through in the development of a management plan for Woodland Caribou Park.

The challenge is for the various user groups to get together, share ideas and arrive at a concensus on co-operative park management. This background information document will serve as a foundation for such discussions.

There may be alternative ways of protecting, developing and managing specific resource values within the park but there can be only one concept for the area—and that concept is wilderness.

References

Introduction

Ontario Ministry of Natural Resources. 1978 *Ontario Provincial Parks: Planning and Management Policies.* OMNR, Toronto, Ontario

_______. 1983. *Backgrounder, Land Use Guidelines.* OMNR, Toronto, Ontario.

Climate

Chapman, L.J. and M.K. Thomas, 1968. *The Climate of Northern Ontario, Climatological Study No. 6.* Federal Department of Transport Meteorological Branch, Toronto, Ontario.

Hills, G.A., 1976. *Mapping the Site Regions and Landscape Districts of Ontario, 1944–1975. Introducing the 1975 Version.* Unpublished Document.

MacIver, D.C., S. Massarovich, P. Sau. 1984. *Climatograms for Ontario Manual.* Environment 2000, Forest Dynamics Group, Ontario Tree Improvement and Forest Biomass Institute, OMNR, Maple, Ontario.

Ontario Ministry of Natural Resources, 1977. *Quetico Provincial Park, Master Plan.* OMNR, Toronto, Ontario.

_______. 1978. *Climate, West Patricia Land Use Plan.* OMNR, Toronto, Ontario.

Rowe, J.S. 1972. *Forest Regions of Canada.* Department of the Environment, Canadian Forestry Service, Publication No. 1300. Information Canada, Ottawa, Canada.

Zoltai, S.C. 1974. *Forest Sites of Site Regions 5S and 4S Northwestern Ontario. Vol. II Research Report No. 95.* OMNR, Div. of Forests, Forest Research Branch, Toronto, Ontario.

Earth Science

Technical Report:

Kor, P. 1986. *A Brief Geology and Geomorphology of Woodland Caribou Provincial Park; Woodland Caribou Park Technical Report #1.* OMNR, Red Lake District, Red Lake, Ontario.

Ayres, L.D. 1978. *Metamorphism in the Superior Province of Northwestern Ontario and its Relationship to Crustal Development.* In *Metamorphism in the Canadian Shield, Geological Survey of Canada, Paper 78–10, p. 25–36.*

Breaks, F.W., R.P. Sage and S.J. D'Appolonia, 1974. Bulging Lake—Embryo Lake, District of Kenora (Patricia Portion). Ontario Division of Mines, Preliminary Map. p. 950; Geological Series; Scale 1: 1 mile.

Ermanovics, I.F., 1970. *Precambrian Geology of Hecla—Carroll Lake Map-Area, Manitoba—Ontario.* Geological Survey of Canada, Paper 69–42, 33p.

Harvey, E., 1979. *A Summary of Earth Science Elements in Woodland Caribou Park Reserve, including Lund Lake and Telescope Lake Reserves (Patricia Portion, District of Kenora).* Ontario Ministry of Natural Resources, Northwestern Region Parks and Recreation, West Patricia Parks, Technical Report No. 1., 121 p.

Lacate, D.S. 1969. *Guidelines for Biophysical Land Classification.* Canadian Forestry Service, Publication #1264. 61 p.

Stockwell, C.H., 1982. *Proposals for Time Classification and Correlation of Precambrian Rocks and Events in Canada and Adjacent Areas of the Canadian Shield. Part 1: A Time Classification of Precambrian Rocks and Events. Geological Survey of Canada, Paper 80–19,* 102 p.

Teller, J.T. and L.H. Thorleifson, 1983. *The Lake Agassiz—Lake Superior Connection.* in *Glacial Lake Agassiz; edited by J.T. Teller and L. Clayton; Geological Association of Canada, Special Paper 26,* p. 261–290.

Zoltai, S.C., 1961. *Glacial History of Part of Northwestern Ontario. Proceedings, Geological Association of Canada, v. 13,* p. 61–83.

Life Science

Technical Report:

Brunton, D.F. 1986. *A Reconnaissance Life Science Inventory of Woodland Caribou Park; Woodland Caribou Park Technical Report #2.* OMNR, Red Lake District, Red Lake, Ontario.

Argus, G.W. and C.J. Keddy. 1984. *Atlas of the Rare Vascular Plants of Ontario, Part 3.* Botany Division, National Museum of Natural Sciences, Ottawa.

Banfield, A.W.F. 1974. *The Mammals of Canada.* University of Toronto Press, Toronto.

Beechey, T.J. & R.S. Davidson. 1980. *Protection of Provincially Significant Natural Areas: The Nature Reserves System,* in, *S. Barrett & J. Riley. Protection of Natural Areas in Ontario.* York University, Toronto.

Hulten, E. 1968. *Flora of Alaska and Neighbouring Territories.* Stanford University Press, Stanford.

Jeglum, J.K., A.N. Boissoneau & V.F. Haavisto, 1974. *Toward A Wetland Classification for Ontario. Information Report O-X-215*, Canadian Forestry Service, Environment Canada, Sault Ste. Marie.

Kelsall, J.P., E.S. Telfer., and T.D. Wright. 1979. *The Effects of Fire on the Ecology of the Boreal Forest with Particular Reference to the Canadian North: A Review and Selected Bibliography*. Occasional Paper 32, Canadian Wildlife Service, Ottawa.

Metzger, D. & J. Warren. 1985. *Botanical Survey of the Bloodvein River Watershed.* Unpubl. Royal Ontario Museum Botany Dept. Manuscript, ROM, Toronto.

Peck, G.K. & R.D. James, 1983. *Breeding Birds of Ontario Nidiology and Distribution. Volume 1: Nonpasserines.* Royal Ontario Museum, Toronto.

Riley, J.L. and S. Walshe. 1985. *New and Interesting Vascular Plant Records from Northern Ontario. Canadian Field-Naturalist 99:* 30–33.

Scoggan, H.G. 1978–1979. *The Flora of Canada.* (4 Volumes). Publications in Botany Number 7 (1–4), National Museum of Natural Sciences, Ottawa.

Walshe, S. 1980. *Plants of Quetico and the Ontario Shield.* University of Toronto Press, Toronto.

White, D.J. and K.L. Johnson. 1980. *The Rare Vascular Plants of Manitoba.* National Museum of Natural Sciences Syllogeus 27, Ottawa.

Caribou

Technical Report:

Wepruk, R. 1986. *Caribou Investigations of Woodland Caribou Park, 1985. Woodland Caribou Park Technical Report #3.* OMNR, Red Lake District, Red Lake, Ontario.

Ahti, T., and R.L. Hepburn. 1967. *Preliminary studies on woodland caribou range, especially on lichen stands, in Ontario. Dept. Lands and Forests, Research Report (Wildlife) No. 74.* Maple. 134 p.

Simkin, D.W. 1965. *A preliminary report of the woodland caribou study in Ontario. Dept. Lands and Forests. Section Report (Wildlife) No. 59.* 76 p.

Hamilton, G.D. 1978. *Aerial census of woodland caribou in the West Patricia planning area. OMNR. West Patricia Land Use Plan Tech. Report No. 6.* Kenora. 13 p.

Hamilton, G.D. 1979. *A study of some woodland caribou wintering areas within the West Patricia planning area. OMNR. West Patricia Land Use Plan Tech. Report No. 16.* Kenora. 21 p.

Fisheries

Technical Report:

Wepruk, R. 1986. *A Fisheries Inventory of Woodland Caribou Park, 1985. Woodland Caribou Park Technical Report #4.* OMNR, Red Lake District, Red Lake, Ontario.

Adams, G.F. and C.H. Oliver. 1977. *Yield properties and structure of boreal percid communities in Ontario. J. Fish. Res. Board Can. 34:* 1613–1625.

Ryder, R.A. 1965. *A method for estimating the potential fish production of north-temperate lakes. Trans. Am. Fish. Soc. 94:* 214–218.

Ontario Ministry of Natural Resources. 1983. *The identification of overexploitation. SPOF working group number 15.* Toronto. 83 p.

______. 1982. *Partitioning Yields Estimated from the Morphoedaphic Index into Individual Species, Yields. SPOF Working Group number 12.* Toronto. 71 p.

Cultural Resources

Technical Report:

Lytwyn, Victor, 1986. *The Fur Trade History of the Bloodvein River; Woodland Caribou Park Technical Report #5.* OMNR, Red Lake District, Red Lake, Ontario.

Bishop, Charles A. 1974. *The Northern Ojibwa and the Fur Trade.* Toronto: Holt, Rinehart and Winston of Canada, Ltd.

Hudson's Bay Company. n.d. Archives.

Leach, Frederick, 1976. *59 Years with Indians and Settlers on Lake Winnipeg.* Winnipeg.

Lytwyn, Victor P. 1984. *Geographical Situation and the Early Fur Trade of the East Winnipeg Country. Regina Geographical Studies, no. 4: 33–40.*

______*. 1985. Ezekiel Solomon: Master Pedlar of the Little North, unpublished paper presented at the Fifth North.* American Fur Trade Conference, Montreal.

Masson, L.R. (ed.) 1960. *Les Bourgeois de la Compagnie du Nord Ouest.* New York: Antiquarian Press Ltd.

Morton, Arthur S. 1973. *A History of the Canadian West to 1870–71.* Toronto: University of Toronto Press.

Ray, Arthur J. 1974. *Indians in the Fur Trade: Their Role as Trappers, Hunters and Middlemen in the Lands Southwest of Hudson Bay.* Toronto: University of Toronto Press.

Rich, Edwin E. 1960. *Hudson's Bay Company.* (3 vols.), Toronto: McClelland and Stewart Ltd.

Smith, Shirley A. 1975. *James Sutherland; Inland Trader 1751–1797. Beaver vol. 306:* 18–23.

Wallace, W.S. (ed.) 1934. *Documents Relating to the North West Company.* Toronto: The Champlain Society.

Warren, William W. 1885 (1970). *History of the Ojibways Based upon Traditions and Oral Statements.* St. Paul (reprinted by Ross and Haines, Minneapolis, 1970).

Recreation

Coen, Gerald M., and W.D. Holland, 1976. *Soils of Waterton Lakes National Park, Alberta. Agric. Can., Env. Can., Alberta Instit. of Ped., S-73-33, Info. Report-NOR-X65.* Min. of Supply and Services 1976. Johanns-Gough Ltd., Waterloo, Ontario.

Hamill, Louis. 1977. *Methods Used for Evaluating Recreational Rivers in Canada.* in *River Recreation Management and Research Symp. Proc. U.S.D.A. for. Serv. Cen. Tech. Rep. NC-28.* p. 273–278. North Cent. For. Exp. Stn., St. Paul, Minn.

Hooper, R.A. 1977. *Assessing the Recreational Potential of Waterways: A Description and Evaluation of Selected Systems. Res. Pap. 77–1.* 51 p. Navigable Mt. Rivers Study, Nat. Hist. Res. Div., Parks Canada, Western Region, Calgary, Alberta.

Jurrand, Priidu, 1972. *Wild Rivers Survey 1971: Quantitative Comparison of River Landscapes. Spec. Rep. 72-1,* 29 p. Can. Dep. Indian Aff. North Dev., Nat'l Hist. Parks Branch, Plann. Div. Ottawa, Canada.

Langhorn, Ken. 1977. *The Missinaibi River Recreation Potential.* OMNR, Northern Region, Cochrane, Ontario.

MacKintosh, E.E. 1979. *Impact of Recreation on Vegetation and Soils in Rushing River Provincial Park, Ontario.* Prepared for Dep. Environ., Can. For. Serv., S. Ste. Marie, Ont., and OMNR, Prov. Parks Br., Toronto, Ont. Report 0-X-290, 52 p.

Merriam, L.C. Jr., and C.K. Smith, 1974. *Visitor Impact on Newly Developed Campsites in the Boundary Waters Canoe Area. J. For. 72(10):* 627–630.

Terry, Claude E. 1977. *A Filter System for Determining River Suitability for National Wild and Scenic River Status.* in *River Recreation Management and Research Symp. Proc. U.S.D.A. For. Serv. Gen. Tech. Rep. NC-28.* p. 372-379. North Cent. For. Exp. Stn. St. Paul, Minn.

Market Analysis

Ruston Shanahan & Assoc., Hough Stansbury & Assoc, J.B. Ellis & Assoc. January 1979. *The Fishing and Hunting Lodge Industry in Northern Ontario.* 120 p.

Hough Stansbury & Assoc., J.B. Ellis & Assoc. March 1979. *Crownland Recreation Study—Phase 2. Future Trends and Management Options.* 378 p.

Bedi, N., and P. Clifford 1981. *1980 Survey of Ontario's Resident and Non-Resident Sport Fishermen.* OMNR publ. 149 p.

Cox, E.T., and W.J. Straight 197 . *Ontario angling. Facts and Figures.* OMNR publ. 95 p.

Gray, Jack. 1984, U.S.A. *Adult Participation Data and Projections. University of Wisconsin Co-operative Extension Survey 11.* p. (after Simmons, 1982).

Hallan, D. and D. Driscoll 1985. *1984. Quetico Provincial Park Interior Survey.* Statistical Summary. 46 p.

Tourist Outfitter Profiles 1985. Ministry of Industry & Tourism.

Tourism Trends and Park Visitation. 1984. Parks & Recreational Areas Branch Research Unit.

1984 Non Resident Angling Licences—Red Lake District.

1984 Quetico Interior Camping & Vehicle Permits—Atikokan District.

Quetico Provincial Park Visitation Statistics 1976–1983. Atikokan District.